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What role does family play? The relationship between living arrangements and the well-being of women aged 60 and over in China

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Doctor of Philosophy
The University of Edinburgh
2021
Acknowledgements

I would like to thank my two supervisors, Prof. Alison Koslowski and Dr. Valeria Skafida for their invaluable guidance during this long learning process. They provided me with emotional support during the most difficult times and helped me to complete my studies successfully. They are both respected mentors and moreover friends who can inspire me at every moment. Their guidance has given me a fresh perspective on academic research and, most valuable of all, a real interest in the field I am studying. They helped me to learn how to identify problems and conduct research with great patience, and more importantly, to maintain independent and critical thinking.

I feel blessed to be supervised by Prof. Alison Koslowski and Dr. Valeria Skafida, I can always get new insights in every joyful collaboration. From the general research ideas to the interpretation of definitions, they always have a multi-dimensional evaluation and advice on my articles. This has benefited me tremendously. Thank you deeply for your supervision!

Most importantly, I would like to thank my wonderful parents for supporting me both financially and emotionally, and for always supporting me in my pursuit of learning opportunities in Edinburgh.

I would also like to thank my sweet husband for his unfailing love and support over the years. With his comfort and encouragement, I finally completed my PhD.

Finally, I would like to thank those colleagues, who have been sharing their valuable experience from their postgraduate studies. Their encouragement helped me to get out of my confusion and discover ways to make my academic career more enjoyable.
Abstract

In traditional Chinese family life, intergenerational households provided support for older people. Social and cultural changes in the past decades have seen a growing trend towards smaller families and new family structures. Older people living alone or ‘empty nesters’ has become more common. While the relationship between changing living arrangements and the well-being of older people has received considerable scholarly attention, the impact of new family structures on the well-being of women aged 60 and over in China has not received sufficient attention. In particular, there is a lack of nationally representative longitudinal research on the impact of the trajectory of change in living arrangements on women aged 60 and over's well-being.

This thesis examines the relationship between living arrangements and well-being from the perspective of women aged 60 and over. This study constructs a new multidimensional framework for measuring the well-being of women aged 60 and over in China based on the perspective of the individual older woman, drawing on the concept of social deprivation and the Alkire–Foster counting approach. It uses theories and concepts related to family support and family resource allocation. The study applies data from the China Health and Retirement Longitudinal Study (CHARLS) and uses fixed effects models and logistic regression models.

The study finds that women aged 60 and over in rural areas are more likely than women aged 60 and over in urban areas to experience a decline in the overall level of well-being, which includes the three dimensions of physical, economic and mental well-being, when losing their spouses. Besides, the effect of living with adult children on rural women aged 60 and over’s well-being is negative. For the economic dimension of well-being, when the subjective measure of economic well-being is not considered, the study finds that spouses and adult children have a negative effect on
the economic well-being of rural women aged 60 and over, and they have no effect on the economic well-being of urban women aged 60 and over. When the subjective measure of economic well-being is taken into account, it is found that the role of spouses and adult children on economic well-being could also be negative for rural women aged 60 and over, but the opposite is true for urban women. Urban women aged 60 and over living with a spouse and adult children have better economic well-being than women in any other living arrangement. These findings suggest, to some extent, that there are urban-rural differences in the impact of family support on women aged 60 and over’s well-being. The thesis finds women aged 60 and over in urban areas, often with better social security entitlements, being less dependent on their families than women aged 60 and over in rural areas. The findings also suggest that the role of different types of family members in supporting women aged 60 and over is inconsistent, with the role of spouses likely to be more positive for women aged 60 and over’s well-being than that of adult children.

Furthermore, these findings also suggest that the pattern of resource allocation within intergenerational households in rural China may not be the “Pooling Model of Household Production”. This is corroborated in the next empirical analysis, where results find that for rural women aged 60 and over living with their spouse only, the higher their contribution ratio to the household within a certain range, the lower their subjective economic perceptions. This suggests that in rural China’s older coupled households, the distribution of resources is tied to 'male breadwinner' mentality, and that women aged 60 and over living in wealthy households are not necessarily experiencing better economic well-being. All these findings have important implications for the development of policies related to old age in China.
Contemporary Chinese women aged 60 and over have experienced an accumulation of disadvantages caused by national events such as factory restructuring and social workforce transformation in their early stages. In addition, national social security policies have long been gender-blind. As a result, these vulnerable women aged 60 and over have had to rely on support from family members. At the same time, changes in living arrangement have led to changes in the support they receive from their families.

I first attempt to address the current bias in the measurement of women aged 60 and over’s well-being by constructing a measurement framework specifically designed to measure the multidimensional well-being of women aged 60 and over in China. The novelty of this study lies in the assessment of the well-being of women aged 60 and over in China, a group that has received little research attention. Focusing on the living arrangements and their transition trajectories of the target group, this study first explores the impact of changes in women aged 60 and over’s living arrangements on their well-being through the analysis of CHARLS data. The findings show that living arrangements have a significant impact on the overall level of well-being and the levels of the dimensions of well-being of women aged 60 and over in China, but there are urban-rural differences. For rural women aged 60 and over, the effect of living with a spouse on improving women aged 60 and over’s well-being was significant and positive, but similar findings were not found in urban areas. In addition, my findings suggest that the effect of living with adult children on rural women aged 60 and over’s well-being is negative. This implies that living with and receiving support from adult children may be conditional.

For the economic dimension of well-being, when the subjective measure of economic well-being is not considered, the study finds that spouses and adult
children have a negative effect on the economic well-being of rural women aged 60 and over, and they have no effect on the economic well-being of urban women aged 60 and over. When the subjective measure of economic well-being is taken into account, it is found that the role of spouses and adult children on economic well-being could also be negative for rural women aged 60 and over, but the opposite is true for urban women. Urban women aged 60 and over living with a spouse and adult children have better economic well-being than women in any other living arrangement. These findings may suggest that the pattern of resource allocation within intergenerational households in rural China may not be the “Pooling Model of Household Production”.

Subsequent study shows that women aged 60 and over living with their spouse in rural, coupled households tend to have a ‘male breadwinner’ mentality. This is evident in the fact that in rural households of older couples, an increase in the household income shares of women aged 60 and over decreases both their own and their spouse’s chances of reporting positive economic well-being. On the other hand, for urban women aged 60 and over, an increase in the household income share has no effect on their subjective economic well-being. In addition, in multigenerational households (those living with adult children or living with spouse and adult children), the same conclusion is reached. This suggests that in these households, the intra-household resources allocation is more in line with the unitary household model, where household resources are enjoyed equally by family members.

The study highlights the need for the government to focus on the accumulation of vulnerability among women aged 60 and over early in their life and the need to improve social support systems for these women, rather than placing the responsibility for supporting them solely on the family.
# Table of contents

**TABLE OF CONTENTS** ................................................................................................................. I

**LIST OF TABLES** ......................................................................................................................... IV

**LIST OF FIGURES** ......................................................................................................................... VII

**LIST OF EQUATIONS** .................................................................................................................... VIII

**LIST OF ABBREVIATIONS** ............................................................................................................ IX

**INTRODUCTION** ............................................................................................................................. 1

  - *Research Aims and Questions* .................................................................................................... 7
  - *Thesis Structure* .......................................................................................................................... 8

**CHAPTER 1 RESEARCH RELATED TO LIVING ARRANGEMENTS AND THE WELL-BEING OF WOMEN AGED 60 AND OVER IN CHINA** .................................................................................................................. 11

  - **1.1 Introduction** ...................................................................................................................... 11
  - **1.2 Why study the relationship between living arrangements and the well-being of women aged 60 and over in China?** ............................................................................................................. 11
  - **1.3 Current research related to the relationship between living arrangements and the well-being of women aged 60 and over** .................................................................................................. 38
  - **1.4 Research Aims and Questions** .......................................................................................... 45
  - **1.5 Summary** .......................................................................................................................... 46

**CHAPTER 2 CONCEPTUALISING AND MEASURING CHINESE WOMEN AGED 60 AND OVER’S WELL-BEING** .................................................................................................................................................... 48

  - **2.1 Introduction** ...................................................................................................................... 48
  - **2.2 Understanding Chinese women aged 60 and over’s well-being** ...................................... 48
  - **2.3 Measuring Chinese women aged 60 and over’s well-being** ............................................ 72
  - **2.4 Summary** .......................................................................................................................... 93

**CHAPTER 3 METHODS AND SELECTION OF DATA** ....................................................................... 95
3.1 INTRODUCTION ................................................................................................................................. 95
3.2 QUANTITATIVE RESEARCH .................................................................................................................. 95
3.3 THE CHOICE OF DATA .......................................................................................................................... 97
3.4 ETHICAL CONSIDERATIONS: CONFIDENTIALITY IN THE CHARLS SURVEY ................................. 107
3.5 SUBSAMPLING THE DATA .................................................................................................................... 107
3.6 SUMMARY ............................................................................................................................................. 111

CHAPTER 4 OPERATIONALISATION OF WELL-BEING CONCEPTS ......................................................... 113

4.1 INTRODUCTION ..................................................................................................................................... 113
4.2 OPERATIONALISATION OF WELL-BEING .............................................................................................. 113
4.3 DESCRIPTIVE RESULTS: WELL-BEING OF WOMEN AGED 60 YEARS AND OVER IN CHINA .......... 128
4.4 STATISTICAL METHODS USED IN THE ANALYSIS ............................................................................. 133
4.5 LIMITATIONS OF THE ANALYTICAL APPROACH ............................................................................... 138
4.6 SOFTWARE FOR ANALYSIS .................................................................................................................. 138
4.7 SUMMARY ............................................................................................................................................. 139

CHAPTER 5 LIVING ARRANGEMENTS AND THE WELL-BEING OF WOMEN AGED 60 AND OVER IN CHINA ............................................................ 140

5.1 INTRODUCTION ..................................................................................................................................... 140
5.2 METHODS .............................................................................................................................................. 142
5.3 RESULTS ................................................................................................................................................ 157
5.4 SENSITIVITY CHECK .......................................................................................................................... 171
5.5 DISCUSSION .......................................................................................................................................... 172

CHAPTER 6 LIVING ARRANGEMENTS AND ECONOMIC WELL-BEING OF WOMEN AGED 60 AND OVER IN CHINA .............................................................. 177

6.1 INTRODUCTION ..................................................................................................................................... 177
6.2 METHODS .............................................................................................................................................. 179
6.3 RESULTS ................................................................................................................................................ 186
6.4 SENSITIVITY CHECKS ............................................................................................................................. 193
CHAPTER 7 SHARE OF HOUSEHOLD INCOME AND SUBJECTIVE ECONOMIC WELL-BEING OF WOMEN AGED 60 AND OVER IN MULTIGENERATIONAL HOUSEHOLDS ........................................... 204

7.1 INTRODUCTION ............................................................................................................. 204
7.2 THEORETICAL BACKGROUND AND HYPOTHESES ................................................... 207
7.3 METHODS .......................................................................................................................... 210
7.4 RESULTS ........................................................................................................................... 220
7.5 SENSITIVITY CHECKS ....................................................................................................... 231
7.6 DISCUSSION ....................................................................................................................... 233

CONCLUSION ....................................................................................................................... 238

SUMMARY ............................................................................................................................... 238
RESEARCH IMPLICATIONS AND CONTRIBUTIONS ............................................................... 243
REFLECTIONS ON THE STUDY ............................................................................................... 248
RESEARCH LIMITATIONS AND FUTURE RESEARCH DIRECTIONS .................................. 249

BIBLIOGRAPHY ..................................................................................................................... 252

APPENDIX ............................................................................................................................... 321

A3-1 THE AGE AND SEX STRUCTURE OF CHARLS SAMPLE .............................................. 321
A4-1 14 COMMON CHRONIC DISEASES ............................................................................. 321
A4-2 10-ITEM VERSION OF THE CENTER FOR EPIDEMIOLOGIC STUDIES DEPRESSION SCALE (CES-D SCALE) ..................... 322
A4-3 HIGHEST LEVEL OF EDUCATION .................................................................................. 325
A5-1 COMPARING ME, THE OFFICIAL CHARLS AND GATEWAY TO GLOBAL AGING CONSTRUCTS FOR THE TOTAL HOUSEHOLD INCOME VARIABLE ................................................................. 326
A5-2 INCOME VARIABLES GENERATION PROCESS .......................................................... 326
A5-3 SENSITIVITY CHECK ON LONGITUDINAL WEIGHTS .................................................. 331
A6-1 SENSITIVITY CHECK ON CROSS-SECTIONAL WEIGHTS ........................................... 335
A7-1 SENSITIVITY CHECK ON CROSS-SECTIONAL WEIGHTS ........................................... 338
List of tables

Table 1-1 Average life expectancy for men and women in China between 1960 and 2020 .......................... 34
Table 1-2 Sex ratio of China’s population aged 60+ ..................................................................................... 35
Table 2-1 Dimensions of well-being of women aged 60 and over in China ................................................. 81
Table 2-2 Measurement framework of women aged 60 and over’s well-being in China .............................. 92
Table 3-1 CHARLS attrition rates .................................................................................................................. 101
Table 3-2 Survey non-response for CHARLS wave 2 and 3 by non-responses’ characteristics ............... 102
Table 3-3 Survey weights for CHARLS wave 1, 2 and 3 ............................................................................. 103
Table 3-4 Sample distribution of the population aged 45+ in CHARLS 2011 baseline data vs. distribution of the population aged 45+ in the national census data published by the National Statistics Office in 2011 (%) ................................................................................................................................. 110
Table 4-1 Dimensions, indicators, deprivation and weights of older women’s well-being ................. 126
Table 4-2 Missing values for variables used to calculating well-being deprivation scores for aged 60 years and over ......................................................................................................................................... 127
Table 4-3 Spearman correlation coefficients between variables (unweighted) ........................................ 128
Table 4-4 Deprivation scores for the overall well-being of women aged 60 years and over in China (weighted) ................................................................................................................................. 129
Table 4-5 Deprivation scores for dimensions of well-being for women aged 60 and over in China (weighted) ........................................................................................................................................ 130
Table 4-6 Deprivation scores in the economic dimension (including subjective well-being) (weighted) .... 131
Table 4-7 Distribution of subjective economic well-being among women aged 60 years and over in China: by urban and rural areas (weighted) ........................................................................... 132
Table 5-1 Living arrangements (A seven-category variable) (unweighted) .................................................. 145
Table 5-2 Officially constructed income variables from CHARLS (£1 equals about 9.15 RMB) ............... 151
Table 5-3 Descriptive statistics for categorical variables for models predicting women aged 60 years and over’s multi- well-being deprivation scores .................................................................................. 154
Table 5-4 Descriptive statistics for the continuous variables for models predicting women aged 60 years
AND OVER’S WELL-BEING DEPRIVATION SCORES ........................................................................................................ 155

Table 5-5 The relationship between women aged 60 years and over’s trajectories of transition in living
arrangements and their well-being deprivation scores .......................................................................................... 159

Table 5-6 The relationship between living arrangements and well-being among rural women aged 60 and
over (from living with spouse to other types of living arrangements) (fixed effects model) (weighted) ............................................................ 161

Table 5-7 The relationship between living arrangements and well-being among urban women aged 60 years
and over (from living with spouse to other types) (fixed effects model) (weighted) ................................. 163

Table 5-8 The relationship between living arrangements and well-being among rural women aged 60 and
over (from living with a spouse and adult children to other types) (fixed effects model) (weighted)
........................................................................................................................................................................ 167

Table 5-9 The relationship between living arrangements and well-being among urban women aged 60 and
over (from living with a spouse and adult children to other types) (fixed effects model) (weighted)
........................................................................................................................................................................ 168

Table 6-1 Descriptive statistics for categorical variables for models predicting women aged 60 and over’s
economic well-being deprivation scores (weighted) .......................................................................................... 183

Table 6-2 Descriptive statistics for the continuous variables for models predicting women aged 60 and
over’s economic well-being deprivation scores (weighted) ............................................................................ 184

Table 6-3 The relationship between living arrangements and the economic well-being of women aged 60
and over (weighted)........................................................................................................................................ 187

Table 6-4 The relationship between living arrangements and economic well-being deprivation scores of
women aged 60 and over (weighted) ............................................................................................................... 191

Table 6-5 Distribution of household income per capita ...................................................................................... 194

Table 6-6 The deprivation of economic well-being of women aged 60 and over in China by using different
measures of economic well-being (weighted) .................................................................................................. 195

Table 6-7 The relationship between living arrangements and economic well-being constructed using per
capita household income ................................................................................................................................ 195

Table 7-1 Different categories of women aged 60 and over who were excluded from the sample ........... 212
Table 7-2 Sample distribution of subjective economic well-being (weighted) ........................................... 213
Table 7-3 Gender differences and subjective economic well-being in coupled households (weighted) ..... 214
Table 7-4 Descriptive statistics for categorical variables for models predicting women aged 60 and over
and their spouse’s subjective economic well-being (weighted) ..................................................... 217
Table 7-5 Descriptive statistics for continuous variables for models predicting women aged 60 and over
and their spouse’s subjective economic well-being (weighted) ..................................................... 218
Table 7-6 The relationship between the mean of women aged 60 and over’s share of household income and
their subjective economic well-being for different living arrangements (weighted) ....................... 221
Table 7-7 The relationship between the mean of women aged 60 and over’s share of household income and
their spouses’ subjective economic well-being for different living arrangements (weighted) ......... 221
Table 7-8 Relationship between women aged 60 and over’s share of household income and their subjective
economic well-being under different living arrangements (by urban and rural areas) (weighted) 226
Table 7-9 Relationship between women aged 60 and over’s share of household income and their spouses’
subjective economic well-being under different living arrangements (by urban and rural areas)
(weighted) ........................................................................................................................................... 230
List of figures

FIGURE 1-1 TIMELINE OF THE STATE-INDUCED SOCIOECONOMIC TRANSITION (1950s UNTIL NOW) ........................................ 13

FIGURE 2-1 UNDERSTANDING CHINESE WOMEN AGED 60 AND OVER’S WELL-BEING .................................................. 71

FIGURE 3-1 DISTRIBUTION OF THE SAMPLE COUNTIES AND DISTRICTS IN CHARLS .................................................. 99

FIGURE 3-2 SUB-SAMPLING PROCESS .................................................................................................................. 109
List of equations

EQUATION 1-1 CALCULATION FORMULA OF THE EEBP ................................................................. 23
EQUATION 3-1 DANIEL’S (1999) SAMPLE CALCULATION FORMULA ........................................ 111
EQUATION 4-1 UNITLESS VARIABLE TRANSFORMATION FORMULA ...................................... 118
EQUATION 4-2 A COMPUTATIONAL METHOD BASED ON FUZZY SET THEORY ...................... 119
EQUATION 4-3 DEPRIVATION CUT-OFF: ................................................................................. 123
EQUATION 4-4 CALCULATING THE DEPRIVATION SCORE ..................................................... 126
EQUATION 4-5 FIXED EFFECTS MODEL .................................................................................. 133
EQUATION 4-6 MULTIPLE LINEAR REGRESSION MODEL ....................................................... 134
EQUATION 4-7 LOGISTIC REGRESSION MODEL ....................................................................... 136
EQUATION 4-8 ODDS RATIOS ................................................................................................. 137
EQUATION 5-1 MOVING FROM LIVING WITH A SPOUSE TO OTHER TYPES OF LIVING ARRANGEMENTS .......................................................... 156
EQUATION 5-2 MOVING FROM LIVING WITH SPOUSE AND ADULT CHILDREN TO OTHER TYPES OF LIVING ARRANGEMENTS ........................................................................ 157
EQUATION 6-1 MODEL USED FOR PREDICTING THE RELATIONSHIP BETWEEN LIVING ARRANGEMENTS AND THE ECONOMIC WELL-BEING OF WOMEN AGED 60 AND OVER ........................................................................................................... 185
EQUATION 7-1 THE SHARE OF HOUSEHOLD INCOME OF WOMEN ........................................ 215
EQUATION 7-2 DIVIDED LABOUR INCOME ........................................................................... 216
EQUATION 7-3 A WOMAN AGED 60 AND OVER’S RELATIVE SHARE OF HOUSEHOLD INCOME ......................................................................................................................... 216
EQUATION 7-4 MODEL USED FOR PREDICTING THE EFFECT OF WOMEN AGED 60 AND OVER’S SHARE OF HOUSEHOLD INCOME ON THEIR SUBJECTIVE ECONOMIC WELL-BEING ................................................................. 220
EQUATION 7-5 MODEL USED FOR PREDICTING THE EFFECT OF WOMEN AGED 60 AND OVER’S SHARE OF HOUSEHOLD INCOME ON THE SUBJECTIVE ECONOMIC WELL-BEING OF THEIR SPOUSES ................................................................. 220
## List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHARLS</td>
<td>China Health and Retirement Longitudinal Study</td>
</tr>
<tr>
<td>CCER</td>
<td>China Centre for Economic Research</td>
</tr>
<tr>
<td>CLHLS</td>
<td>Chinese Longitudinal Healthy Longevity Survey</td>
</tr>
<tr>
<td>CFPS</td>
<td>China Family Panel Studies</td>
</tr>
<tr>
<td>CLASS</td>
<td>China Longitudinal Ageing Social Survey</td>
</tr>
<tr>
<td>Hukou</td>
<td>The household registration system</td>
</tr>
<tr>
<td>TVEs</td>
<td>Township and Village Enterprises</td>
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<tr>
<td>Dibao</td>
<td>The minimum living guarantee</td>
</tr>
<tr>
<td>GIP</td>
<td>the Government Institution Pension</td>
</tr>
<tr>
<td>EEBP</td>
<td>the Enterprise Employee Basic Pension</td>
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<tr>
<td>URRSP</td>
<td>Urban-Rural Resident Social Pension</td>
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</table>
Introduction

In traditional Chinese family life, intergenerational households provide support for older people (Chen & Silverstein, 2000; Silverstein et al., 2006a). Older parents usually live with their adult children and receive support from them (Huang, 2018; Logan & Bian, 1999). Government-led social change has brought new opportunities and ideas, and the relaxation of the household registration system (hukou) has allowed a large number of people to move to other cities in search of employment (Gruijters, 2017; Silverstein et al., 2006). Social and cultural changes in the past decades have resulted in a growing transition towards smaller families and new family structures. Older women living alone, or with only their spouse, has become more common (Hu & Peng, 2014). These older women are often portrayed as victims of socio-economic modernisation and cultural change, left behind by their adult children who have moved to cities in search of a better life (Croll, 2006; Gruijters, 2017).

Some scholars have found that living alone is associated with poverty, higher levels of depressive symptoms and more chronic illnesses (Agree, 1993; Kharicha et al., 2007; Smeeding & Saunders, 1998; Victor et al., 2000). Yan, Chen and Yang (2001) found that the economic well-being of older people living alone was worse than that of those living with extended family. Subsequent studies exploring this relationship have found that living away from their adult children prevents older people from receiving as much help with their finances, and, therefore, they have lower economic well-being relative to older people who live with their adult children (Chan et al., 2002; Mutchler et al., 2015; Sun, 2002; Yamada & Teerawichitchainan, 2015). In contrast, older people who live with their adult children are more likely to report positive economic well-being, as their lives are better supported by their adult children (Li et al., 2011).
Other studies, however, suggest that separation does not preclude maintaining close intergenerational ties or receiving intensive support from adult children (Croll, 2006). It is possible that living apart is a residential preference that reflects the preference for privacy and independence between the two generations (Giles et al., 2012). In China and other East Asian countries, it has been observed that, while the number of older people living with their adult children is decreasing, there has been a significant increase in older people living independently near their adult children (Knodel & Ofstedal, 2002; Lei et al., 2011; Whyte, 2003). A study by Zimmer and Korinek (2008) showed that a large proportion of older Chinese people who do not live with their adult children do live in the same community. Although the majority of older people still live with their adult children, many of them also have adult children living nearby with whom they maintain frequent contact and from whom they receive regular non-financial assistance (Bian et al., 1998; Giles et al., 2012; Lei et al., 2015). When comparing the amount of financial support given to older people by adult children who do not live with them, those who are further away are more likely to give large amounts of financial support (Lei et al., 2015). Therefore, the relationship between living with adult children and the well-being of people aged 60 and over may not necessarily be relevant.

While many scholars have explored the impact of living arrangements on the well-being of older people, few studies have examined the relationship between living arrangements and well-being from the perspective of women aged 60 and over specifically. In particular, there is a lack of nationally representative longitudinal research on the impact of the trajectory of change in living arrangements on women aged 60 and over's well-being.

There are three reasons the living arrangements and well-being of contemporary older Chinese women need to be looked at. Firstly, women aged 60 and over in China in the 21st century are very dependent on family support due to the double hardship
of early accumulation of disadvantage and the gender blindness of state policy. More specifically, the adolescent years of these women were at a time when the People's Republic of China had just been established. At that time, the country's educational development was relatively low and compulsory education was not yet universal\(^1\). Given the long-standing patriarchal culture of the society at the time, these women's parents had a much stronger patriarchal mindset than today's young and middle-aged parents. These women were subject to gender bias in parental expectations and investment in education, such that men had priority over women in access to education. Given the relatively limited resources available to most families, few women were able to receive a good education (Dong et al., 2007; Jiang et al., 2014; Wang, 2013). Relatively low levels of education and the inherent constraints of socio-economic development left this generation of women aged 60 and over with few opportunities for formal and well-paid labour force participation during their middle and young adulthood. Additionally, due to their low levels of education and competitiveness in the workforce, women aged 60 and over were laid off in large numbers during the government restructuring of state-owned enterprises in the mid-1990s\(^2\) (Appleton et al., 2002; Jin et al., 2006a). At the same time, as women were, and often still are, required to take on more child and elderly care, women aged 60 and over took on a large amount of domestic work in their middle and young adulthood. The relatively high number of children these women had\(^3\) increased the weight of unpaid domestic work they were burdened with and further hindered their

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\(^1\) In 1986, the Compulsory Education Law of the People's Republic of China was promulgated and nine years of compulsory education became official in mainland China (The Central People's Government of the People's Republic of China, 2006).

\(^2\) In 1978, to improve the efficiency of the labour market, the state carried out an economic reform. In the mid-1990s, to further improve the efficiency of state-owned enterprises and speed up economic reform, the central government turned state-owned small and medium enterprises into market-owned enterprises (Meng, 2012). Therefore, in urban areas the number of public-sector jobs was reduced, the state gradually withdrew as the main welfare provider and lifetime jobs were also ended (Stockman, 1994).

\(^3\) The one-child policy was only introduced in 1979, so most women aged 60 and over currently have more than one child.
social labour participation (Jia, 2014; Xu et al., 2019; Zhang, 2015).

In addition, the state’s policy of different retirement ages in the 1950s, instituted to protect women workers, led to women withdrawing from the labour force significantly earlier than men of the same age\(^4\), resulting in a shorter period of continuous work for them than for men\(^5\). The current pension policy and health insurance policy are calculated from cumulative earnings from past years of work. In a system using this method of calculation, women of this generation are at a particular disadvantage. This is further exacerbated by state welfare policies which are not gender-friendly in terms of employment, maternity leave and childcare (Budig et al., 2012; Grady, 2015; Leitner, 2001; Lewis, 2009; Möhring, 2016, 2018).

As a result, the current generation of women aged 60 and over is disadvantaged by the cumulative effects of early education, culture and policy, yielding less income as they enter old age.

Women aged 60 and over’s per capita income is lower than that of their male counterparts. The 2000 census found that the average monthly income of women aged 60 and over in urban and rural China was only 51.7% and 68.3% of that of their male counterparts, respectively (Jia, 2007a). This trend continued in 2010, with the average income of women aged 60 and over only 57.04% of that of their male counterparts.

\(^4\) In the 1950s, most work was manual labour. The state believed that when women reached a certain age, their physical strength decreased, and they could not fulfil the job requirements. As a result, the state decided that women should retire earlier than men (Wang, 2012).

\(^5\) In informal employment, the retirement age of women is not clearly defined, but the pension age is set at 60. In formal employment, women engaged in blue-collar work retire at the age of 50 and women engaged in white-collar work retire at the age of 55. High-ranking government officials and professors can retire at the age of 60 (Chen & Turner, 2015; Yu, 2016). Informal employment (also known as non-standard, atypical, flexible, alternative, irregular and precarious employment in other countries) is defined by the International Labour Organisation (ILO) as workers who lack formal labour contracts, receive few or no social insurance benefits and are often not protected by labour laws (Park, Wu, et al., 2012a).
counterparts (Zhang et al., 2011). In addition, among men and women who retire holding the same position, the income from a woman’s pension is lower than that from a man’s (Tan & Yang, 2013, p. 201). In urban areas, following retirement, the income from a woman's pension is only about 80% of a man's pension for the same level of work (Chen & Zhang, 2015). In rural areas, pension income is even lower than in urban areas, and more importantly, the pension provision for women aged 60 and over is very low (Xu, 2015b). Moreover, the proportion of women aged 60 and over with zero income is much greater than the proportion of men aged 60 and over with zero income, and the percentage of women aged 60 and over with zero income is increasing year after year, with 8.43% of women aged 60 and over having zero income in 2010, an increase of 5.06 percentage points since 1990 (Zhang & Yang, 2019). The accumulation of these disadvantages in their early years leaves them with lower incomes and a higher dependence on family support. However, it is unclear how the change in family support that comes with a change in traditional family living arrangements will affect the well-being of women aged 60 and over who are significantly dependent on their families.

Secondly, an individual's bargaining power is often tied to her contribution to the household, generally external income (Klasen & Lahoti, 2016). As the income of women aged 60 and over is at a very low level compared to that of other family members, it may lead to low participation from women in the household’s economic-production activities. This subsequently reduces women’s positions in household decision-making and in the distribution of benefits (Gao, 2019; Jia, 2007b). Thus, the poverty rates of economically dependent women aged 60 and over may be underestimated when the household is used as the unit of analysis. However, in China, current poverty alleviation for people aged 60 and over at this stage is generally evaluated on a 'household' basis (Peng, 2019). For example, the current national poverty line generally uses the 2011 rural poverty line standard: an
annual per capita income of ¥2,300 (£221)^6, adjusted for annual price fluctuations, as the poverty line for that year (Liu & Sun, 2018; Xu et al., 2019; Yang, 2018). The urban poverty line generally adjusts the rural national poverty standard using a comparison between urban and rural purchasing power (Xu et al., 2019b). This household-based poverty line averages out the poverty status of household members; women aged 60 and over's poverty, which is concealed within the household, may be overlooked. The definition of the poverty line is not only related to the precise identification of the poor, but also to subsequent poverty policies. The current household-based poverty line makes it impossible to identify the poverty status of women aged 60 and over within the household, which may lead to mis-targeting of poverty reduction goals and limit the effectiveness of poverty reduction policies.

The study of the relationship between living arrangements and women aged 60 and over’s well-being is therefore important to determine whether and what impact the changes in family support brought about by new living arrangements have had on women aged 60 and over’s well-being. It is possible that the well-being of women aged 60 and over who are highly dependent on their families is being challenged by these changes.

Thirdly, most studies have focused on the relationship between living arrangements, the presence of support from adult children and older people’s well-being. These studies have examined the relationship between living arrangements and well-being by controlling for the presence or absence of support from children. However, there has been very little attention paid to the spouse. According to Shen, Chen and Wei (2013), the spouse remains an important financial, instrument and mental support for the women aged 60 and over. Not only that, but in most of the literature examining the relationship between living arrangements and older people's well-

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^6 ¥1 = £0.09646
being, the multidimensional nature of well-being has not been given much attention, with many studies based on measures of only a single dimension of well-being (Qu, 2015; Carmel, 2019; Gildner et al., 2019; Hou et al., 2019; Lifshitz, Nimrod & Bachner, 2019; Yang et al., 2020; Matsuura & Ma, 2021). Furthermore, in studies of women aged 60 and over’s economic well-being, many have used the household economic level as a proxy for the individual economic level of women aged 60 and over (e.g., Zhu & Fan, 2017; Liu & Sun, 2018; Song & Zhan, 2018; Deng, Bi & Nie, 2019; Li, Lu & Zhang, 2019; Xu, Xia & He, 2019). But, even for women aged 60 and over living in wealthy households, their economic situation may not be congruent with the economic situation of the household. Scholars have observed that men are often less poor than women (Agarwal, 1997; Doss, 2006a; Duflo, 2003a; Espinoza-Delgado & Klasen, 2018; Quisumbing & Maluccio, 2003a; Vijaya et al., 2014), and women aged 60 and over may have a higher risk of experiencing poverty than other household members within a household (Arber, 2006; Price, 2003a; Zaidi, 2010a).

Research aims and questions

Based on the above discussion, this PhD project is therefore centred on the relationship between living arrangements and the well-being of women aged 60 and over. It examines these two questions for women in China in the 21st century:

**R1:** What is the well-being of women over 60 in China and how is it measured?

**R2:** After controlling for other influencing factors, how do living arrangements affect the well-being of Chinese women aged 60 and over? Are there urban-rural differences in this effect?

**R2-1:** After controlling for other influencing factors, how do living arrangements affect the overall economic well-being of women aged 60 and over in China? Are there urban-rural differences in this effect?

**R2-2:** After controlling for other influencing factors, how do living arrangements affect the different dimensions of well-being of women aged 60 and over in China?
Are there urban-rural differences in this effect?

R3: What is the relationship between women aged 60 and over’s share of household income and their subjective economic well-being? Are there urban–rural differences in the relationship?

Thesis structure

Chapter 1 of the thesis begins by explaining why I am researching this topic. It examines the impact of state-led economic changes and current policies in society on women aged 60 and over from a life course perspective. It illustrates the particularities of this group by looking at the socio-historical context of women aged 60 and over in current Chinese society, which is highly dependent on family support. In addition to this, the chapter provides an overview of the current literature on the relationship between living arrangements and women aged 60 and over’s well-being. An in-depth discussion of the limitations of the current research is also provided.

Chapter 2 focuses on the question of what the well-being of women aged 60 and over in China is and how to measure the well-being of these women. Through a review of the relevant literature on the meaning and measurement of well-being and taking into account the characteristics of Chinese women aged 60 and over, Chapter 2 provides a conceptual framework for understanding the well-being for women aged 60 and over in China as well as proposing a new way of thinking about measuring the well-being of these women based on an individual perspective.

Chapter 3 revolves around the selection of data and research methods. I explain why I chose a quantitative research method and provide my reasons for choosing the China Health and Retirement Longitudinal Study (CHARLS) data, along with a detailed description of this data. The limitations regarding this data are also explained in this chapter. Additionally, ethical considerations are explored. The subsampling of the sample is elaborated upon in this chapter.
Chapter 4 focuses on how the more theoretical research described above can be operationalised in the data, and in particular the issue of how to operationalise women aged 60 and over’s well-being in the CHARLS data is presented in detail. This chapter borrows from the Alkire-Foster Counting Approach to calculate women aged 60 and over’s well-being. This also opens up a new computational approach for subsequent research measuring well-being. The inaccuracy of many current studies involving the measurement of women aged 60 and over’s economic well-being, as discussed previously, is an unsolved problem. This makes the issue of how to measure women aged 60 and over’s individual economic well-being of particular importance. Therefore, a descriptive analysis of the CHARLS data for the measurement of personal economic well-being is also presented.

Based on the framework for measuring well-being proposed above, Chapter 5 examines how changes in living arrangement affect women aged 60 and over’s overall well-being and different dimensions of well-being. A fixed effects model is used to simulate the relationship between the current dominant trajectories of change in living arrangements in China (from living with a spouse to other living arrangements and from living with a spouse and adult children to other living arrangements) and women aged 60 and over’s well-being.

Due to data limitations, subjective measures of economic well-being only appear in the first wave of data used in the analysis. Therefore, in order to have a more comprehensive understanding of the impact of living arrangements on economic well-being, Chapter 6 places the focus on economic well-being. It examines the impact of living arrangements on the economic well-being (both objective and subjective measures) of women aged 60 and over.

Comparing the effects of living arrangements on economic well-being found in
Chapters 5 and 6, it is found that economic well-being with the addition of subjective measures provides a more accurate picture of the economic well-being of individuals within households. Chapter 7 therefore shifts the focus to within the household, exploring the relationship between women aged 60 and over’s share of household income and their subjective well-being in different living arrangements. The analysis is not limited to coupled households but extends to multigenerational households. It explores whether there are differential results in the relationship between women aged 60 and over's household income share and their subjective well-being under different household living arrangements (coupled households, multigenerational households).
Chapter 1 Research related to living arrangements and the well-being of women aged 60 and over in China

1.1 Introduction

In traditional Chinese family life, older parents usually live with and are supported by their adult children (Huang, 2018; Logan & Bian, 1999). As a result, adult children are often seen as the primary supporters of their parents (Chen & Silverstein, 2000; Silverstein et al., 2006). Since the relaxation of the household registration (hukou) system in 1978, China has seen significant migration between regions, with many members of the younger generation seeking opportunities in more developed areas (Silverstein et al., 2006a), and people have begun to move away from traditional living arrangements. This shift has attracted the attention of a large number of scholars. Much of the current research has focused on the relationship between the new living arrangements and the well-being of people aged 60 and over, but little has focused specifically on how these new living arrangements affect women aged 60 and over. Thus, section 1.2 of this chapter first sets out why it is important to focus on the impact of living arrangements on women aged 60 and over, followed by an overview of existing research on this topic in section 1.3. In the following section 1.4, the research aims and questions for this thesis are identified, and the chapter is summarised in section 1.5.

1.2 Why study the relationship between living arrangements and the well-being of women aged 60 and over in China?

1.2.1 Women aged 60 and over

The research in this thesis was conducted on women aged 60 and over. This is
because these women, born in the 1950s and before, experienced a state-induced socio-economic transition that lasted for more than half a century (1950 to the present). The socio-economic, political, cultural and demographic changes that this transition brought to Chinese society also had a profound impact on the well-being of these women. Firstly, the disadvantages they accumulated early in their life due to the state-induced socio-economic transition, and the economic and health disadvantages they experienced later in their life as a result of gender-blind policies, made these women far more dependent on family support than men of their own age and the next generation of women. This reduction in family support as living arrangements changed may have had a negative impact on the well-being of this group of women who are highly dependent on family support. Thus, the research in this thesis focuses on the impact of these changes on the well-being of this group of women aged 60 and over. In the following sections, I will elaborate on the social context experienced by these women during their lives, current social welfare policies and changes in family living arrangements. To facilitate the reader's understanding of the chronology of the policies and reforms mentioned in this chapter, Figure 1-1 provides a timeline of these policies and reforms.
The founding of the People’s Republic of China 1949

Urban-rural division of the household registration system (hukou) established 1958

Family planning policy enacted (‘no more than two children’) 1973

Relaxation of hukou system 1978

Economic reform 1978

The founding of the ‘Old Rural Pension’ 1992

Further relaxation of hukou system The late 1990s

The founding of the Urban-Rural Resident Social Pension (URRSP) 2009

The founding of the new rural social pension 2009

The founding of the new rural social pension 2014

1979 ‘One-child policy’

1986 The introduction of nine-year compulsory education

1991 The State began to explore the multi-pillar pension insurance system

2011 The founding of the urban residence’s pension

2015 ‘Universal two-children policy’

Figure 1-1 Timeline of the state-induced socioeconomic transition (1950s until now)

Source: Author constructed according to www.gov.cn
1.2.2 The social context experienced by women aged 60 and over during their lifetime

1.2.2.1 Before 1950

Prior to the state-induced institutional reforms, three ideologies were most prevalent in Chinese society: traditional Chinese social filial piety, traditional gender ideology and patriarchy (Huang, 2018; Mao, 2018; Wang, 2018). These ideologies deeply affected women's lives. For example, traditional gender ideology and patriarchy were mainly manifested in two beliefs. First was the belief that men are superior to women, and second was the belief that the man is the breadwinner. The belief that men are superior to women typically emphasises that the social status of men is higher than that of women. Under the influence of this belief, within a family, women were pressured to prioritise the needs of other family members over their own. In other words, male family members had priority access to resources in the family, and when the family had too little resources for every family member, women were expected to decrease their use of resources and to give priority to other family members. As mentioned in section 1.2.1, most women aged 60 and over in China today were born in the 1950s or before. Before the 1950s, they were in their childhood or adolescence. At that time, education was a scarce resource, so women’s opportunities for education were restricted (Dong et al., 2007). As a result, most of them did not have a high level of education during this period.

The belief that men are superior to women was also expressed in society. In most areas (e.g., politics, economics, law, religion, education, military and family) men held dominant positions (Wang, 2013). Both the distribution system and the inheritance system prioritised males, meaning men had priority in the inheritance and the ownership of family property (Xu, 2013). The belief that men are superior to women restricted women’s equal access to resources, and the belief that the man is the breadwinner often gave men the power to limit women’s employment.
opportunities to working within the household, further strengthening women’s subsidiary roles in the family (Wang, 2006). Owing to the low status and low education level of women, and the fact that they were mainly engaged in household work, they had almost no income during that period (Wang, 2006).

In addition to the traditional gender ideology and patriarchy mentioned above, the ideology of filial piety was also prevalent in society at that time. Filial piety operates on the belief that the younger generation has an obligation to support the older generation, including offering both physical care and financial support (Huang, 2018; Sun, 2017). This meant that even though this particular demographic of women had almost no income and society offered them no social security, the expectation was that their living needs in later life could still be met as long as there were younger family members available to provide such support (Whyte, 2003).

1.2.2.2 1950s–1970s
The 1950s to the 1970s was the period of the socialist planned economy. In order to accelerate the speed of industrialisation, the state chose to temporarily sacrifice benefits offered to farmers and agriculture workers. The state instead committed all their resources to developing industry (Xu, 2009). Through the compulsory reduction in the sale prices of agricultural products, the state purchased these products at low prices and converted part of the farmers' income into national industrialisation start-up funds (Huang, 2018; Xu, 2009). During this period, farmers were providing the necessary agricultural products and funding national industrialisation (Huang, 2018; Meng, 2012; Xu, 2009). To ensure there were enough farmers to provide sufficient food and funds for cities, the state kept most of the population in rural areas and controlled employment opportunities in rural areas (Meng, 2012). The government strictly controlled the immigration of the rural population to urban areas through the hukou system established in 1958 (Figure 1-1).
The hukou system divided the Chinese population into two different statuses: urban and rural. The classification criterion of rural and urban residences was based on whether the person held an agriculture hukou or non-agricultural hukou (Yu, 2016). Because the benefits given to farmers were sacrificed to guarantee the industrialisation of China, people with an urban hukou had a higher social status than those with a rural hukou. It was very difficult to switch from a rural hukou to an urban hukou during this period (Chan & Buckingham, 2008; Chan & Zhang, 1999). Therefore, hukou was not only used for demographic classification, but was also a symbol of social status (Yu, 2016). The social stratification created by hukou continues to deeply affect Chinese society to this day (Yu, 2016).

People who held an urban hukou were assigned to urban work units for unified management. The urban employment system was mainly based on the work unit system (danwei). Employers had no right to hire or fire workers. People’s jobs were uniformly allocated by the state and wage standards were uniformly regulated by the state (Meng, 2012). In order to speed up industrialisation, the state advocated for equality between men and women and put forward the ‘Iron Girls’ campaign to encourage women to participate in the labour market (Jin et al., 2006). Therefore, at that time, most people in urban areas were assigned to either state-owned enterprises and institutions (the state-owned danwei) or collective-owned enterprises and institutions (the collective-owned danwei). A person’s danwei provided them with lifelong jobs and very generous social welfare benefits, such as pensions that were fully funded by the state and the enterprises. No individual contributions were required (Zhao & Zhao, 2018).

The Chinese pension insurance system had just been established, and pensions were designed to only cover workers who were officially employed in the urban areas, such as formal employees in government agencies and state-owned enterprise employees (Jiang, 2018). The retirement age for receiving pensions was 60 for men;
however, for women the age varied based on the type of work they performed. Women engaged in blue-collar work got their pension at 50 years old, women engaged in white-collar work got their pension at 55 years old, and high-ranking government officials and professors got their pension at 60 years old. (The reasons why different retirement ages exist are explained in more detail in section 1.2.3.1.) In addition, upon reaching retirement age, at least 15 years of work experience was required to receive a pension. The pension was calculated by multiplying the salary level of the previous year by the replacement rate. In this period, the replacement rate of pension insurance could reach 90% of the original salary (An, 2012).

The state also provided free housing, childcare and education. At that time, more than 60% of urban children under the age of six were cared for in danwei nurseries or publicly funded nurseries (Jia & Dong, 2013). Consequently, the participation rate of females in the labour force increased significantly. From 1949 to 1978, the percentage of females in the urban labour market rose from 7.5% to 32.9%. Most of these women worked full time in the state or collective sector (Dong & Yang, 2006).

Unlike the urban residents, rural residents were mainly managed in people's communes (Yu, 2016). Both men and women were assigned to work in labour services. Working hours and tasks were uniformly distributed by these communes. Rural people could not immigrate freely to urban areas. Although the people's commune system was also a form of unified national population management, it differed significantly from the danwei system. Industrialisation was built on sacrificing farmers’ benefits, while in the people's commune system, an individual’s income was completely dependent on their own labour output. Their welfare benefits were not as good as that of urban residents. The childcare system was like the childcare system in urban areas – it was covered by the commune’s nurseries. However, the pension system was completely different. The formal pension system in rural China was not established, so family and land were the main economic
resources for older people. For those people who had no source of income after retirement age, the people’s commune took care of them (Hu, 2012). Therefore, the rural social welfare system for older people was a collaboration between the people's commune and the family (Hu, 2012), but the people's commune only played a supplementary role while the family shouldered most of the responsibility. In addition, rural residents did not have medical, education or housing benefits. Consequently, the rural population held the lowest social status in Chinese society (Yu, 2016).

Although the state promoted equality between men and women, it chose not to remove the traditional gender role ideology (Song, 2011, 2012). This ideology manifested in two main aspects. First, even though the state took on most of the childcare responsibilities, women still needed to do most of the housework (Sun & Chen, 2017). Second, although the state advocated for equality between men and women and encouraged female employment, occupational gender segregation was apparent in urban areas. As mentioned earlier, during this time, people in urban areas worked mostly in the state-owned danwei or the collective-owned danwei, but the income and benefits offered differed between these two units. People who worked in the collective-owned danwei had lower wages and only marginal benefits, while those working in the state-owned danwei were paid much higher wages and received better benefits (Zhou et al., 1997). Furthermore, since the work was uniformly distributed by the state, promotions and mobility between work units were also regulated by the state (Yu, 2016). Under these circumstances, most women worked in collective enterprises and their jobs were typically low-level occupations with low incomes, few benefits and low skill requirements, such as textile work, tailoring, leather work, printing, inspection and other light industry sectors, or business services and other flexible low-income or informal jobs (Liu & Niu, 2000; Wang, 2015; Ye & Jia, 2010). Women had very few rights or opportunities
for promotion, and their income and welfare benefits were relatively low (Dong & Yang, 2006; Ngo, 2002).

Women who are aged 60 and over in the 21st century were adults or teenagers during this period, working in the labour market or receiving an education. They were mainly engaged in low-level jobs with low income, poor benefits and low skill requirements. Although some women in urban areas could receive an education at this time, the education system was not established and they usually received just a basic level of education, covering only reading and writing (Liu, 2003). As such, the educational level of these women was still not very high during this period. These disadvantages in the early stages of life may have resulted in further disadvantages in later life. This point will be discussed in detail in section 1.2.2.3.

1.2.2.3 From 1978 to 2011

After 1978, economic reform became the next influential state-induced reform. It not only transformed the state from a planned economy to a market economy, but also brought a series of changes in society, social ideologies (e.g., the decline of the culture of filial piety and the rise in individualism) and technology. In addition to economic reform, the state gradually withdrew from its direct role in caring for older people in urban areas. Instead, the state focused on improving the social security system for both rural and urban areas in China (Hu, 2012). The state carried out a series of social security reforms over the next few decades, such as the reform of the urban pension system and the establishment of the rural pension system.

To improve the efficiency of the labour market, the state carried out economic reform in 1978. To further improve the efficiency of state-owned enterprises and speed up economic reform, the central government turned state-owned small and medium enterprises into market-owned enterprises in the mid-1990s (Meng, 2012).

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9 Nine years of compulsory education was only formally introduced in China in 1986 (see Figure 1-1).
Urban areas saw a reduced number of public-sector jobs, and the state stopped allocating jobs to workers (Stockman, 1994). As mentioned in section 1.2.2.2, before the economic reform, most women were in low-level jobs with low income, low benefits and low skill requirements. The female labour force was regarded by the state as a supplementary labour force. When there were not enough formal jobs available, women would be laid off first (Jin et al., 2006). Therefore, these women were laid off after the reform (Appleton et al., 2002). Simultaneously, the people's commune system in rural areas was replaced by the nationwide Household Contract Responsibility system, giving farmers the freedom to manage their own agricultural production. In addition, population mobility between rural and urban areas began to increase with the continuing relaxation of hukou. Farmers could migrate to urban areas and change to non-agricultural jobs (Yu, 2016). Due to the economic reform, a large number of new jobs were created, including self-employment and Township and Village Enterprises (TVEs) (Yu, 2016). Some of the rural women and the women who had been laid off changed to these types of jobs or exited the labour market entirely. (Appleton et al., 2002; Dong & Yang, 2006)

At the same time, to reduce the cost of childcare, the state privatised free childcare and shifted the responsibility for children from the state to the family, mainly to women (Song, 2011). This shift in responsibility in childcare and the transition from the planned economy to the market economy caused a conflict for women between family and work (Cook & Dong, 2011; Sun & Chen, 2017). Owing to the privatisation of childcare, many families had to use expensive private childcare services, which was very difficult for low-income families (Du & Dong, 2013). Therefore, from 1990 to 2000, the female employment rate dropped from 77.4% to 63.1%. In addition, the state’s initiatives to promote equality between men and women changed. The state became more lax in advocating for gender equality, and as a result, traditional gender ideologies were revived and gender discrimination became increasingly prominent in the labour market (Ji et al., 2017a). Because the market economy
emphasises efficiency and profit (Meng, 2012), gender ideology led employers to believe that women were far less valuable and useful than men due to their household and family responsibilities, which led to a reluctance to hire women (Sun & Chen, 2017). Scholarly evaluation of this economic reform suggests that it not only reduced the support for working women, but also weakened equality between men and women and caused a resurgence in the patriarchal ideology (Pimentel, 2006; Sun & Chen, 2017a).

During this period, today’s women aged 60 and over were in their youth and middle age. Most of them experienced economic reform and many were laid off or switched jobs. Many of them were in jobs with low pay and few opportunities for advancement, and many also faced the challenge of work–life balance. The cumulative disadvantage theory shows that the accumulation of disadvantages in the early stages of life will affect later gains (Crystal et al., 1992; Elder, 1995). In other words, people’s working history is closely associated with income in later life (Peeters & Wouter, 2015; Sefton et al., 2011; Stewart, 2014; Wahrendorf, 2015). Sefton et al. (2011) point out that the types of employment pursued by most women are not associated with high retirement income. Most of the occupations that women engage in when they are young are low-level jobs with low human capital requirements, low wages and few opportunities for advancement. These types of jobs are not conducive to subsequent capital accumulation, which leads to low income in later life (Sefton et al., 2011). The accumulation of disadvantages in the early stages of the lives of these women aged 60 and over has a large impact on their social security benefits. Section 1.2.3 discussed this point.

Another important reform is allowing people to work after retirement age. During the socialist planned economy period, working beyond retirement age was not allowed due to the state's control of the labour distribution (Yu & Schömann, 2015a). In recent decades, people have been able to re-enter the labour market (Jiang & Du,
2009), but women aged 60 and over have faced gender and age discrimination. A discussion of this point is set out in section 1.2.4.

1.2.3 Gender blindness in social security policy

For decades, the needs of women aged 60 and over have been subordinate to the needs of the household and have not entered public policy makers’ whitelists. Therefore, there are rarely social policies centred around women aged 60 and over. The social security policies for people in China includes pension insurance, health insurance, minimum living guarantee (*dibao*) and old-age allowance. Pension insurance and health insurance are universal policies that cover a wide range of the older population. The *dibao* is a social assistance system for people who are below the poverty line. The old-age allowance is a social welfare policy, which is a subsidy for people who are over 80 years old. Later, I will introduce these policies separately (section 1.2.3.1 talks about pension insurance, section 1.2.3.2 talks about health insurance and social assistant insurance are discussed in section 1.2.3.3) and explore the issues of gender blindness in them.

1.2.3.1 Gender pension gap in pension insurance

As mentioned in section 1.2.2.2, before the 1980s, China’s pension insurance system only covered workers in formal jobs in urban areas. Those covered were mainly government staff and state-owned enterprise staff. After the economic reform, the state turned some state-owned enterprises into market-owned enterprises (see section 1.2.2.3). To improve the efficiency of pensions in the market economy, the state began to explore a multi-pillar pension security system (Zhu & Walker, 2018b). The pension system was reformed in 1991 (Figure 1-1). The Government Institution Pension (GIP) remained unchanged, meaning that it is mostly the state that contributes. However, the Enterprise Employee Basic Pension (EEBP) has changed. It has become a shared contribution by the state, enterprises and individuals.

The method for calculating the EEBP income consists of two parts: the social pooling
account and the personal account. The social pooling account is the responsibility of the enterprises. The standard payment is 20% of employees’ average salary in the region in the year before the person retires. The local government has the authority to decide the contribution rates for their local enterprises in accordance with the level of economic development in the region. For example, owing to the different age structures of the population in Shanghai and Guangzhou, the social pooling contribution rates are 22% and 12%, respectively (Chen & Turner, 2015). The personal account is contributed to by individuals. The contribution rate is 8% of the average monthly salary, the social pooling account and the personal account of the person. The calculation formula of the EEBP is as follows:

**Equation 1-1 Calculation formula of the EEBP**

\[
Pension 	ext{ insurance monthly payment} = \text{Social pooling account} + \text{personal account}
\]

**Social pooling account**

\[
= \frac{\text{average monthly salary of employees in the province in the previous year} \times (1 + \text{average contribution index})}{2} \times \text{payment period} \times 1%
\]

**Personal account**

\[
= \frac{\text{personal account savings}}{\text{personal account pension calculation months}}
\]

The number of months for the personal account pension calculation is 139 months for women whose retirement age is 60. For women who retire at 55, the number of months is 170, and for women retiring at 50, 195 months. This reform of the Enterprise Employee pensions reduced the replacement rate of the employees’ pension incomes from about 90% to about 45% (An, 2012).

The reform of the Enterprise Employee pension insurance created inequality in the pension insurance of government agencies, institutions and enterprise employees (Yang, 2015). To reduce the unfairness and enhance the mobility of pension
insurance between government agencies, institutions and enterprises, the government reformed the GIP in 2015 (Figure 1-1) (R. Zhao & Zhao, 2018). This reform requires individuals and work units in government agencies and institutions to contribute to the pension insurance. The contribution is 8% for individuals and 20% for work units. It should be noted that although the GIP has been reformed, it still has not merged with the EEBP and its benefits are still the best (Zhu & Walker, 2018a). The GIP and the EEBP are currently the two main pension insurances for government staff and enterprise employees in China.

It was not until 1992 that the state introduced a pension insurance for rural residents called the Old Rural Pension (Figure 1-1). However, due to the low participation rate, this insurance was stopped in 1999, and the pension insurance system in rural areas once again ceased to exist (Wu & Lv, 2012). It was not until 2009 that the country established the New Rural Social Pension Insurance. However, for the unemployed residents of urban areas, such as housewives, self-employed people and other professionals, there was no social security until 2011 (Zhao & Zhao, 2018; Zhu & Walker, 2018a). To address this problem, the state issued a special pension insurance policy called the Urban Resident Pension (URP) (Yang, 2015b). Later, to solve the disunity between urban and rural pensions and to enhance the mobility of pensions between urban and rural areas, the state merged these two pensions into the current Urban-Rural Resident Social Pension (URRSP) (Jiang, 2018).

URRSP is very different from the GIP and the EEBP in pension accounting. The most notable differences are that participation is voluntary and it does not calculate pension based on the length of working years. Instead, it uses a pay-as-you-go model. The main contributors are individuals, the village committee and the local government. At the individual level, the insured person chooses the level of payment. The payment grade standard is currently set at ¥100, ¥200, ¥300, ¥400,
¥500, ¥600, ¥700, ¥800, ¥900, ¥1,000, ¥1,500 or ¥2,000 per year in total. Each region’s local government can increase the payment grade according to its situation. For example, the minimum annual contribution in Wuhan is ¥100 and the maximum annual contribution is ¥1,200, while the minimum annual contribution in Shanghai is ¥500 and the maximum is ¥1,300 (Chen and Turner, 2015a). The village committee’s subsidy standard is determined by its ability to pay. However, many village committees cannot provide the subsidies to individuals owing to a lack of money. Therefore, the main contribution is from government subsidies and personal contributions (Yan, 2016). The subsidies provided by local governments vary according to the level of payment of the insured people. For the lowest level of payment, the subsidy standard is not less than ¥30 per person per year. The higher the level, the higher the subsidy amount. The subsidy level can also be adjusted according to the level of development of the local government. For example, in Wuhan, the subsidy for all insured people is the same (¥30), but in Shanghai, it varies according to the level of payment. The specific subsidy amount fluctuates between ¥200 and ¥400 (Chen and Turner, 2015a). The other requirement is that the pensioner must be at least 60 years old when receiving a pension and they must have contributed to the pension for at least 15 years.

Although the state has undergone a series of reforms in the pension system, it still ignores the fact that women typically have fewer working years, perform more unpaid work within their household and are mostly concentrated in low-level, low-income jobs. Few women work in jobs covered by the GIP or the EEBP, so not many women are eligible for these two pensions (Li, 2009). Furthermore, even if women are in eligible occupations, the average annual pension they receive is less than that of men when they retire. Even those who were high-ranking government officials and professors obtain less than men at the same occupational level (Chen & Li, 2004; Tan & Yang, 2013; Wang & Liu, 2008). This is because working years and income are the keys in deciding how much pension a person receives. Due to the designated
retirement age (see discussion in section 1.2.2.2), women in these occupations generally leave their jobs five to ten years earlier than men in China (R. Zhao & Zhao, 2018). Since women have fewer working years than men and calculations are based on years of work, women’s pensions are usually worth less than men’s pensions.

The retirement age was implemented in the 1950s. At that time, most work was manual labour. The state believed that when women reached a certain age, their physical strength decreased, and they could not fulfil the job requirements. As a result, the state decided that women should retire earlier than men (Wang, 2012). But now, manual labour is gradually being replaced by machines, meaning the retirement age has become an unreasonable limitation (Yu, 2016). However, the state has not yet changed the retirement age. In addition, women usually interrupt their work at various points in their lives to care for children, or retire early to take care of their grandchildren, which can lead to women having fewer working years than men (Zhao & Zhao, 2018). Besides early retirement age, women aged 60 and over were more likely to work in low-income jobs in the early stages of their lives, which also affects their current pension income since personal contribution is based on the average monthly salary in the previous year (Figure 1-1). Therefore, because of their relatively low income and short working life, women’s contribution to personal accounts is low and this leads to lower pensions.

The URRSP does not use the number of years worked to calculate pension, but instead uses ‘pay as you go’ method. However, it still does not offer many benefits to women aged 60 and over covered by the plan. As stated previously, the reason is that this type of pension is based on the individual’s ability to pay. Women covered

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8 As mentioned in section 1.2.2.3, the era of the socialist planned economy spanned from the 1950s to the 1970s. The state focused on industrialisation. Women in urban areas usually worked in collective enterprises, and most held low-level jobs with low wages, low benefits and low skill requirements, such as textile work, tailoring, leather work, printing, inspection and other light industry sectors. Women in rural areas worked mostly in agriculture.
by this pension mostly engage in informal, low-income occupations. Their low income means they cannot pay as much as men, and consequently, women tend to choose lower payment grades, or they choose not to participate in the URRSP at all (Yang, 2016). Wang’s 2012 study found that even though the pension insurance rate increases every year, the pension coverage rate of women aged 60 and over is lower than that of men aged 60 and over. This is especially true for those women in rural areas, many of whom are not covered by any pension plan (Xu, 2015).

The other issue that women aged 60 and over may face is the less of their spouse’s pension. When the insured person dies, the balance in the pensioner’s personal account can be inherited. However, it should be noted that inheritance is limited only to the balance in the deceased’s personal account. The social pooling and the government subsidy part of their pension cannot be inherited. In addition, scholars have found that the characteristics of current personal accounts are slow accumulation, fast withdrawal and low pension replacement rate. Therefore, the personal account has a high probability of overdraft as the balance available for inheritance is often not very much or sometimes even zero (Ai & Zhu, 2016). It may happen that the balance in the personal account is not enough to cover the woman’s remaining life, or the husband’s personal account does not have a balance for them to inherit.

In summary, China’s current pension insurance mainly consists of the three pension insurances mentioned above: GIP, EEBP and URRSP. These three pension types are for government staff, enterprise employees and other groups of people, and the benefits differ between them. GIP is the best, EEBP is moderate and URRSP is the worst (Chen and Turner, 2015a; Zhu and Walker, 2018a). This pension system has been evaluated by scholars to be a fragmented pension insurance policy (Wan et al., 2017). Pension is important to guarantee the economic safety of older people. However, because women aged 60 and over often did not work when they
were young or engaged in low-level occupations with low human capital requirements, low wages or lack of prestige, they have very low pensions, or sometimes even no pensions, in their later life.

1.2.3.2 Gender inequity in health insurance

China's current basic medical insurance is also fragmented and stratified (Cun, 2014), and there is also gender inequality in how basic medical insurance is structured (Li, 2009; Wang, 2012; Xu, 2015a). China's current basic medical insurance system consists of two parts: the basic medical insurance system for government staff and enterprise employees and the basic medical insurance system for urban and rural residents. Similar to the structure of the pensions, basic medical insurance includes a personal account and a social pooling account. For those who are employed, both the work unit and the individual contribute to the basic medical insurance payment. The payment rate is 2% of the employee’s salary and 6% of the employer’s salary. From these contributions, 30% is allocated to the personal account and the remaining 70% is allocated to the social pooling account. Outpatient and small medical expenses are paid from personal accounts, while hospitalisation and large medical expenses are paid from social pooling accounts. The minimum payment threshold for the social pooling fund is 10% of the average annual salary of local employees, while the maximum is 400% (Cun, 2014). For unemployed people and those in flexible employment, it is a pay-as-you-go system. The individual and the state both contribute to the personal and social pooling accounts of the basic medical insurance (Jiang, 2018). In terms of reimbursement, the medical insurance reimbursement ratio of government staff and enterprise employees is higher, from 70% to 90%, based on local levels of development, while the medical insurance reimbursement ratio of urban and rural residents is lower, from 50% to 75%, based on the local levels of development (Liu & Bai, 2018).

The same gender inequality problem exists in medical insurance as in pension insurance. Neither takes into consideration the large number of women aged 60 and
over who did not work or who were engaged in informal work throughout their lives. Only half of women aged 60 and over in urban areas are covered by basic medical insurance, while the population of older men who are covered exceeds 70% (Wang, 2012). Meanwhile, in rural areas, most women aged 60 and over do not have medical insurance (Jia, 2011). The medical expenditure of the population of women aged 60 and over is lower than that of older men (Xu, 2015). There are also large gender differences in the reimbursement of medical expenditures between women aged 60 and over and older men. In 2010, the average medical expenses of older men and women were ¥2,272.29 (£250.88) and ¥2,171.05 (£239.70), respectively. However, the average amount paid by older men and women was ¥1,450.25 (£160.12) and ¥1,719.87 (£189.89), respectively (Xu, 2015). Although the average medical expenses of women aged 60 and over were lower than those of men aged 60 and over, the amount paid by the individual is higher in women than in men. As a result of this inequality, the number of women aged 60 and over who seek medical care is smaller than men aged 60 and over (Xu, 2015). Women aged 60 and over choose not to see a doctor and, as a result, some minor illnesses go untreated and develop into serious illnesses, further worsening their health (Xu & Wei, 2005).

1.2.3.3 Social assistance insurance
Social assistance mainly includes the \textit{dibao} and the old-age allowance. This is a welfare subsidy for people whose family’s per capita income is lower than the minimum living standard of residents over 80 years old or who are disabled (Wang, 2018). Social assistance does not directly target women aged 60 and over, but it mainly benefits them through their family. However, this design does not consider the issue of resource allocation within the household. The question is whether women aged 60 and over benefit from this household-level government subsidy since this kind of subsidy often treats the household as a unit, regardless of each person’s situation within the family. It treats all members in the household equally,

\footnote{Based on 2010 exchange rates: ¥1=£0.09557.}
but this assumption is not always accurate. In fact, women may be poorer than men even though they are in the same household (Casper et al., 1994). Wang & Ci (2004) found similar results when they pointed out the gender stratification of poverty within households: women are more likely to experience poverty. For example, in order to ensure the living needs of other family members, the needs of the male members of the household are often met first (i.e., they receive the best food, while women’s own living needs are given the lowest priority) (Jia, 2011; Wang, 2018). Therefore, in these households, it is possible that women's living needs are given a relatively low position. The design of the social assistance insurance does not take this into consideration.

Furthermore, the level of social assistance is relatively low. Currently, the *dibao* is 25% of the average income of the population. For poor and unhealthy people, the current level of assistance cannot guarantee that their basic living needs are met (Jiang, 2018). In addition, the amount and standard of assistance is based on the state’s financial conditions. When the state’s finances cannot afford social assistance, assistance will be reduced. This has resulted in a mismatch between the needs of the people and the actual assistance provided (Yang, 2015).

In summary, the social security policy lacks gender awareness, and is not designed to take into account the accumulation of disadvantages that women aged 60 and over experience due to low education, low-paying jobs, and shorter working years. Policy makers ignore the unpaid work done by women aged 60 and over in the early stages of their lives. Instead, policy makers regard this unpaid work as a kind of ‘love and emotional contribution’ provided willingly by women (Yan, 2016). Such gender-blind policies put women aged 60 and over at a disadvantage in terms of their economic and physical well-being in later life.
1.2.4 Work beyond pension age: women aged 60 and over accumulate disadvantages in early stages of life

Women aged 60 and over have faced gender and age discrimination throughout their lives. Employers believe that women are far less valuable than men because they have more family responsibilities, which has led to employers' reluctance to hire women (Sun & Chen, 2017). First, this gender discrimination stops women aged 60 and over from finding jobs in the labour market, and second, China's market economy is dominated by manufacturing that requires relatively high physical strength. As a result of this, younger people are more highly valued than older people in the job market (Yu, 2016). In addition, skill and education levels have a great impact on job competition (Yu, 2016). Due to the rapid development of society, the traditional skills of older people cannot keep pace with the new skills required in current jobs. Today’s women aged 60 and over had restricted access to educational resources and were excluded from the labour market in their youth. They had low levels of education and either did not work or engaged in informal jobs. These experiences put them at a disadvantage in the labour market in later life. With the lack of corresponding skills’ training offered for older people (Cruz, 2019; Hermalin, 2003), low levels of education and skill may restrict older people, especially women aged 60 and over, from finding jobs.

Scholars have discovered that the average monthly income of women aged 60 and over is much lower than that of older men (Jia, 2011; Zhang & Yang, 2019). For example, the 2000 census data study found that the average monthly income of older Chinese urban and rural women was between 51.7% and 68.3% of the income of older men (Jia, 2007). This trend continued, and in 2010, the average income of women aged 60 and over was 57.04% of the income of older men (Zhang & Yang, 2019). When looking at the total populations of older men and women, the

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10 This can be seen from section 1.2.1.1, 1.2.2.2 and 1.2.2.3.
percentage of women aged 60 and over earning no income is much higher than that of older men earning no income, and the percentage of women aged 60 and over earning no income is increasing each year. In 2010, those women earning no income accounted for 8.43% of the population of women aged 60 and over, an increase of 5.06% when compared with 1990 (Zhang & Yang, 2019).

1.2.5 Poverty alleviation policies related to women aged 60 and over
Also, women aged 60 and over do not benefit much from some of the poverty alleviation policies that are specifically targeted at women. The current anti-poverty policy specifically for women is the ‘China Women's Development Program 2011–2020’, and the executive department is mainly the Women’s Federation. The Women’s Federation also cooperates at all levels with local governments to take different measures in this programme. Although some advancement has been made in the elimination of female poverty, problems still pervade the system. This policy is for all poor women and includes skill training, entrepreneurial capital, technical assistance and so on. However, these types of assistance are not suitable for women aged 60 and over.

The needs of women aged 60 and over have not been adequately considered. First, as mentioned in section 1.2.4, women aged 60 and over face prejudice and discrimination based on both gender and age in employment. Thus, compared with young people, women aged 60 and over do not have a competitive advantage in the job market. Second, women aged 60 and over with poor health are unlikely to re-enter the labour market. Third, some skill-training courses are too short to cover all the necessary skills and do not meet the needs of the majority of poor women (Wang, 2018). Therefore, the benefits of this policy are not effective for women aged 60 and over.
1.2.6 The state's position

The state has gradually withdrawn itself as the main welfare provider and advocated instead for citizens to ‘rely on family’ (Zhou, 2019, p. 36). For example, the Law of the People's Republic of China on the Protection of the Rights and Interests of the Older People was enacted in 1996, in which Article 10 clearly stipulates, ‘The older people mainly rely on the family for the old age support, and family members should take care of the older people’ (The Central People’s Government of the People’s Republic of China, 2012). Later, the December 2012 revision of the same law clearly states, ‘The older people’s care is based on the family, and family members should respect and take care of the older people’ (National People’s Congress [NPC], 1996).

1.2.7 Changing in living circumstances

After the discussion in sections 1.3.1 to 1.3.7, it can be seen that this group of women aged 60 and over is influenced by early education, culture and policies that create an accumulation of disadvantages early in life, which, combined with gender-blind social policies, lead to disadvantages in social benefits in later life, such as low pension income and low health insurance reimbursement rates. Not only this, but the State has shifted the responsibility for old-age support to the family and encouraged adult children to provide support for their parents. This combination of actions has made family support the primary source of livelihood for most women over the age of 60 (Huang & Chang, 2020). However, changes in life circumstances have made it challenging for this group to access family support.

First, the average life expectancy of women has increased by 34 years over a period of 60 years (from 1960 to 2020) (see Table 1-1). The increase in average life expectancy means that the amount of time women aged 60 and over in China need to be supported by their families has increased. Secondly, the average life expectancy of Chinese women always been higher than the average life expectancy of men over the 60-year period (see Table 1-1). Additionally, women in this age
range tended to marry men older than themselves, (Duan & Jin, 2020; Gao, 2012; Shen & Yang, 1995). As a result, these women live longer than their spouses. According to the seventh census released by the National Bureau of Statistics (2020) (see Table 1-2), in the 60 to 64 age group, the sex ratio of males to females is 100.98 (females = 100). In the over 65 age group, however, the proportion of males is consistently smaller than that of females, and the number of males in the population continues to decrease in the older age groups. By the over 80 age group, the sex ratio of males to females is only 74.27 (females = 100). Thirdly, China lacks a pension inheritance system (see discussion in section 1.2.3.1), so after the loss of a spouse, women aged 60 and over not only lose the support of their spouse but also have no access to their spouse's pension and thus, become more dependent on the support of their adult children.

Table 1-1 Average life expectancy for men and women in China between 1960 and 2020

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>42</td>
<td>45</td>
</tr>
<tr>
<td>1970</td>
<td>57</td>
<td>61</td>
</tr>
<tr>
<td>1980</td>
<td>65</td>
<td>68</td>
</tr>
<tr>
<td>1990</td>
<td>67</td>
<td>71</td>
</tr>
<tr>
<td>2000</td>
<td>70</td>
<td>73</td>
</tr>
<tr>
<td>2010</td>
<td>72</td>
<td>77</td>
</tr>
<tr>
<td>2020</td>
<td>75</td>
<td>79</td>
</tr>
</tbody>
</table>

Source: Constructed by the author based on data from World Bank (2020).
Table 1-2 Sex ratio of China’s population aged 60+

<table>
<thead>
<tr>
<th>Age group</th>
<th>Gender ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-64</td>
<td>100.98</td>
</tr>
<tr>
<td>65-69</td>
<td>96.47</td>
</tr>
<tr>
<td>70-74</td>
<td>95.03</td>
</tr>
<tr>
<td>75-79</td>
<td>89.48</td>
</tr>
<tr>
<td>80+</td>
<td>74.27</td>
</tr>
</tbody>
</table>

*Source: Constructed by the author based on data from the Seventh Census released by the National Bureau of Statistics (2020).*

However, changes in living arrangements have led to a dramatic change in traditional family support patterns. Since the 1990s, with the easing of urban-rural mobility restrictions, a large number of young adults have moved away from home, changing the basis of living arrangements in traditional societies where family members lived together, resulting in long-term intergenerational residential separation (Sun, 2010). The decline in the proportion of people aged 60 and over living with their offspring in China has reduced their access to instrumental support such as care and household help from their adult children (Huang & Chang, 2020). Since 1982, the proportion of people aged 60 and over living with their spouse only has increased each year in both urban and rural areas. For urban areas, it increased from 12.77% in 1982 to 34.27% in 2010. In comparison, it moved from 13.58% to 26.63% in rural areas over the same period. Moreover, the proportion of people aged 60 and over living alone in both urban and rural areas is increasing year on year (Wang et al., 2016).

For women, the proportion of women aged 60 and over living with their adult children declined significantly but the proportion of women aged 60 and over living alone or with a spouse increased significantly. Compared to the proportion of women aged 60 and over living alone or with a spouse only in 2000, the proportion of women aged 60 and over living alone or with a spouse only increased by
approximately 24.86% by 2011 (Wang, 2014). Some studies suggest that the proportion of women living alone aged 60 and over will increase further due to the longer life expectancy of women compared to men and the increasing number of adult children living away from their parents (Li et al., 2003; National Health and Family Planning Commission of the People’s Republic of China, 2015). Changes in living arrangements and increased distance from adult children have reduced the opportunities for adult children to provide stable care support for mothers left behind (Song et al., 2012), reducing the availability of resources for home care (Huang & Chang, 2020).

At the same time, the intergenerational reciprocity mechanism in traditional filial culture is slowly disintegrating as social norms change, such as the gradual rise of the concept of fair exchange in the market economy, and younger generations no longer believe that supporting their parents is unconditional (Huang, 2018; Yan, 2003). In addition, the rise of extreme utilitarian individualistic beliefs has also weakened the filial beliefs in traditional culture (Yan, 2003). Not only that, but the younger generation tends to choose employment in more developed places, such as moving from rural to urban areas or to Beijing, Shanghai, Guangzhou, etc. (Silverstein et al., 2006a). The cost of living in developed cities is usually higher and the younger generation may struggle to cover daily expenses. They may not be able to provide financial support for their parents (Zhang & Sun, 2011). These migrations weaken kinship ties between families (Lei et al., 2012a) and reduce the opportunities for adult children to provide support (Ding et al., 2019; Du & Xie, 2014a). Thus, the family support available to women aged 60 and over years of age faces significant challenges as their life circumstances change.

1.2.8 Section summary
It can be seen from the overall discussion in section 1.2 that: due to the influence from early education, culture and policies, women aged 60 and over in China have
suffered an accumulation of disadvantages in their early life stages, which, combined with gender-blind social policies, lead to disadvantages in social security in later life (e.g., low pension income and low health insurance reimbursement rates). Not only this, but the country has shifted the responsibility for old-age support to the family. This series of actions has resulted in women aged 60 and over being more dependent on family support than men aged 60 and over. As they live longer, they are required to receive support for longer. However, the corresponding pension inheritance policies have not changed, leaving them without a spouse's source of income when widowed. At the same time, their well-being is being challenged by the decline in child support due to changes in traditional living arrangements, which is a phenomenon that deserves our attention.

Firstly, for those women aged 60 and over, studying the impact of changes in living arrangements on their well-being will reflect their vulnerability, as well as making society and the government aware of the problem and looking for ways to address it. Secondly, although the education and income levels of the next generation of women have risen, gender inequalities in the labour market, such as gender wage gaps and differences in job levels, are still prevalent (Ji et al., 2017b). At the same time, women's dependence on family support has not decreased much as the current social welfare policies remain gender-blind. Another aim of this study is therefore to make the next generation of women aware of their well-being in later life and to encourage them to make informed choices about their retirement options to ensure that they have a good standard of living in their later life.

With this research aim in mind, this thesis seeks to understand how these changes in living arrangements affect the well-being of the current cohort of women aged 60 and over years of age in China. In order to clarify this issue, my next section (section 1.3) focuses on a review and discussion of current academic research on this issue. In
this section, I also identify my specific research questions and the direction of my research.

1.3 Current research related to the relationship between living arrangements and the well-being of women aged 60 and over

This paper examines how the living arrangements of women aged 60 and over in China affect their well-being. 'Living arrangements, 'women aged 60 and over', 'well-being', 'China' and synonyms of these words were used for literature search. Due to the very small amount of literature obtained from the initial search, I expanded the search to include older adults\(^1\). The Chinese databases used in the search included China National Knowledge Infrastructure (CNKI), Wanfang Data and Duxiu Data. The English databases included Scopus, the International Social Science Bibliography, Wiley Online Library, Springer, SAGE Journals, Science Direct, Routledge and Taylor & Francis Group. In order to ensure that the most recent research findings were obtained, the search for literature was limited to publications within the last 10 years. Different selection criteria were used for English and Chinese literature to ensure the reliability and comparability of these sources. In China, articles published in core journals\(^2\) tend to be of high quality, whereas internationally, article quality is determined by the peer-reviewed nature of the work. Relevant literature with high quality can be searched in the China Social Science Citation Index (CSSCI) developed by Nanjing University or in core journals of Peking University (PKU). To ensure the quality of the cited papers, most of the English literature cited in this study consists of peer-reviewed articles (excluding some non-literature citations, such as

\(^{11}\) In some of this literature using ‘older people’, they treat people over 50 years old as ‘older people’. so, literatures reviewed in this section include studies where the sample is people over 50 years of age.

\(^{12}\) Articles included in the China Social Science Citation Index (CSSCI) developed by Nanjing University or core journals of Peking University (PKU) are core journal articles.
government reports, conference papers and some core websites on well-being research). Similarly, the majority of Chinese literature comes from core journals (excluding some non-literature citations, such as government reports, government documents and laws). Eventually, the search results in these platforms revealed a total of 157 publications, of which 69 duplicates, 23 with irrelevant content and 18 non-quality literature were excluded, resulting in 47 usable publications. Overall, although the impact of living arrangements on the well-being of older people in China has received considerable attention from researchers, the understanding of this impact is not yet comprehensive. A review of the literature suggests that this may be due to the fact that these studies use different measures of well-being, have different study populations, and consider different factors affecting the relationship between living arrangements and well-being. Various issues have led to different conclusions being drawn between studies. I will discuss these in more detail below.

A dominant view in existing research on the impact of living alone on the well-being of older Chinese people is that living alone has a negative impact on both subjective well-being, such as life satisfaction, and objective well-being, such as physical health (Ren & Treiman, 2015; Wang et al., 2014; Wang et al., 2018). These studies have generally used the life satisfaction and CES-D scale of depression as key indicators of subjective well-being. Furthermore, the vast majority of studies were conducted based on cross-sectional data and lacked observations on changes in living arrangements. The study by Wang et al. (2018) is the only one that investigated the longitudinal impact of changes in living arrangements on subjective well-being of rural people aged 60 years or older based on six periods of follow-up data in Anhui Province. However, as this study was limited to the rural areas of Anhui Province, it is unclear whether the findings are applicable to the whole country.

Subsequent research based on nationally representative data and using the same measures of well-being did reveal different findings. A study by Chen (2019), which
used data from the 2011 China Health and Retirement Longitudinal Study (CHARLS), found that the effect of living alone on the subjective well-being of people aged 60 and over was not significant when individual subjective residence preferences were added to the model. In addition, cross-sectional research based on data from the 2011 Chinese Longitudinal Healthy Longevity Survey (CLHLS) by Zhang (2015) showed that relationship with adult children also influenced the effect of living alone on the subjective well-being of people over 65. If the relationship with adult children is positive, the effect of living alone on their subjective well-being disappears. In addition, Burnette et al. (2021), using data from the first wave of the WHO Study on Global Aging and Adult Health (SAGE), found that the effect of living alone on the well-being of those over 50 in urban areas is minimal if they are able to achieve adequate levels of social cohesion through social participation. However, in rural areas the effect of social cohesion levels is not significant. Individual residence preferences, relationships with children and social participation were found to influence the relationship between living arrangements and older people's well-being in these studies. But because these studies used cross-sectional data, it is uncertain how these three factors influence the relationship between living arrangements and older people's well-being. Further evidence will be required in subsequent longitudinal data studies.

There is also still no consensus on the specific impact of living with adult children on the well-being of older people. Shen et al. (2013) used indicators from the CES-D depression scale and life satisfaction together as constructs of subjective well-being. By using cross-sectional data from the 2005 Chinese Longitudinal Healthy Longevity Survey (CLHLS), Shen found that living with children was effective in reducing depression and increasing life satisfaction among people aged over 65. Moreover, the presence of children significantly improves the well-being of people over 65 who are widowed or divorced. Shen believes that the effect of this mode of residence on the subjective well-being of people over 65 comes from supporting them materially.
and humanly, as well as from emotional companionship. However, this view was challenged in a study made by Wang & Xu (2020). It was found that while not living with adult children had a significant negative impact on subjective well-being and life satisfaction for people aged 60 and over, the impact of living with adult children on subjective well-being changed when financial support and care from adult children were taken into account. Specifically, this negative impact tends to disappear if the over-60s are supported both financially and instrumentally by their adult children. However, this finding is based on cross-sectional data from the 2010 China Family Panel Studies (CFPS). Although this data is nationally representative, it is a cross-sectional analysis and therefore we cannot determine the relationship between living arrangements, intergenerational support and the subjective well-being of people aged 60 and over. Furthermore, the findings of Shen et al. (2013) and Wang & Xu (2020) may also differ because they used different measures of subjective well-being and different samples.

A subsequent longitudinal study based on four waves of Chinese Longitudinal Healthy Longevity Survey (CLHLS) data (2005-2014) also found no correlation between living with adult children and subjective well-being for people aged over 65 when the support of non-cohabiting adult children was taken into account (Xu et al., 2019). In this study, the construct of subjective well-being differs from Wang & Xu’s (2020) study. It is based on life satisfaction, positive and negative feelings. Although this study is a longitudinal study based on nationally representative data and the findings are somewhat more reliable, it is not clear whether the findings apply to a more comprehensive definition of well-being and to another sample group of people. Also, neither the Wang & Xu (2020) nor the Xu et al. (2019) study comprehensively examines the impact of intergenerational support. For example, the Wang & Xu (2020) study did not examine the emotional support provided by adult children, while the Xu et al. (2019) study did not examine the financial and instrumental support provided by adult children. Neither study examined the impact
of intergenerational support according to the amount and intensity of support provided. It is therefore unclear whether the findings of the above studies will change when all the above factors are considered. Therefore, in future research, consideration of intergenerational support in its entirety will also need to be included in the analysis to help develop a deeper understanding of it.

Interestingly, whether the impact of living with adult children on the well-being of older people is positive or negative may change when measures of well-being tend to focus on health. For example, a study based on data from the ‘Well-being of people aged 60+ in Anhui Province’ survey from 2001 to 2015 found that the health-related quality of life of people aged 60 and over living with children was negatively affected (Wang et al., 2018). Similarly, in a study based on data from the 2013 wave of the Chinese National Health Service Survey in Shanxi Province, a similar conclusion was reached by measuring the EQ-5D scores of people aged 60 and over (Zhou et al., 2018). EQ-5D contains five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. However, both studies were conducted in one Chinese province each. So given the specificity of the sample, it is not clear whether their results are applicable to China as a whole.

In addition, the study by Zhu et al. (2019) used data from the Chinese Longitudinal Healthy Longevity Survey (CLHLS) 2008 and 2011/12 waves to compare the effects of living with adult children on subjective well-being (both negative and positive emotions) in people over 65 in both rural and urban areas. Their study found that living with adult children significantly increased positive emotions in the target group in rural China, but it did not significantly affect negative emotions in the target group in both rural and urban China. Although they used data from two periods, the method they used was still pooled sample cross-sectional analysis, so it is still not clear how the relationship between living with adult children and subjective well-being differed between urban and rural areas for people over 65. In addition, the
sample for this study represents those aged over 65 in 2008, so it is unclear whether the findings still apply when samples representing other groups are used.

The impact of living with grandchildren is also unclear and there is very little literature on this topic, with only two studies found on this topic. One is mentioned above, the Wang et al. (2018) study, which is based on a survey of people aged 60 and over in Anhui. Their study found that the presence of grandchildren enhanced the parental role and self-efficacy of people aged 60 and over, which had a positive role in the developing high levels of subjective well-being of people aged 60 and over. However, using cross-sectional data from the 2010 China Family Panel Studies (CFPS), Ren & Treiman (2015) found that living with grandchildren alone significantly reduced the level of subjective well-being of people aged 60 and over. But, the negative effect disappears when adult children are living with them. Ren & Treiman's 2015 study measured wellbeing in a different way to that of the Wang et al. 2018 study. It is therefore unclear whether these conclusions remain the same under other measures of well-being.

While there is a large amount of research on the impact of living arrangements on the well-being of older people, there is very little research on the impact of living arrangements on the well-being of women aged 60 and over, with only five of the 47 literatures relating to this topic. Within these five literatures, Jacka's 2014 study was conducted by interviewing women aged 50-80 in rural Ningxia. It was found that not living with adult children did not mean that the well-being of these women declined. On the contrary, many of these women gained a great deal of respect, self-esteem and informal power in the home informal power in the home from their living situation and thus had relatively high levels of well-being. Similar findings were found in Huang's 2018 study. This study used the same research methods but targeted for a group of women aged 60 years and older. It was a longitudinal study collecting data from 2005 to 2013. However, as these data are from a small village
called Lianhe in central China, it is not clear whether the findings of this study are applicable to women aged 60 and over in other parts of China. The other three literatures are based on nationally representative data, but they do not measure well-being in the same way. For example, Williams et al. (2017) used depression, life satisfaction and self-rated health as measures of well-being, while in Ren & Treiman's 2015 study, they replaced self-rated health with happiness using a five-point scale. In contrast, the study by Deng et al. (2016) employed a different approach to the two previous studies, using an individual-level dietary balance index to refer to well-being.

Additionally, the three literatures differ in the data used, the sample and the methods of data analysis. Specifically, Ren & Treiman's 2015 study and the Williams et al. 2017 study both use the China Family Panel Studies (CFPS) data. But Williams et al. uses two waves of data, while Ren & Treiman only used data from one wave. Deng et al. (2016) instead used data from the China Health and Nutrition Survey (CHNS) in 2009 and 2011. In terms of sample and data analysis methods, Ren & Treiman's 2015 findings are based on the results of a cross-sectional analysis of women aged 60 and over, while Deng et al. (2016) used lagged analysis to examine the relationship between living arrangements and the well-being of women aged 60 and over. Williams et al. (2017) used ordered logistic regression to analyse the effect of living with a spouse on the well-being of women aged over 50 and added whether or not they lived with their children as a control variable to the model. Differences in measures of well-being, sample inconsistencies and differences in analytical methods have not led to consistent findings from these studies.

Firstly, the positive influence of living with a spouse on the well-being of older women was confirmed by Ren & Treiman (2015) and Williams et al. (2017), but was not found in the Deng et al. 2016 study. Secondly, living with adult children was found to have a negative impact on the well-being of women aged 60 and over in the
studies by Ren & Treiman (2015) and Deng et al. (2016), but was not found in the study by Williams et al. (2017). Additionally, the impact of living with grandchildren was not addressed in the Williams et al. 2017 study. The study by Deng et al. (2016) found that living with grandchildren had a negative impact on the well-being of women aged 60 and over years of age. However, in the Ren & Treiman's 2015 study, the outcome changed depending on whether these women also lived with their adult children. Specifically, if adult children and grandchildren lived with women aged 60 and over, living with grandchildren did not have a negative impact on the well-being of these women. However, if they live with their grandchildren only, there is a negative impact on the well-being of these women.

Based on the above discussion, it is clear that there is currently a lack of clarity regarding the relationship between living arrangements and the well-being of women aged 60 and over. These divergent findings are associated with inconsistencies in the way well-being has been measured in previous studies, the use of samples representing different groups, the lack of longitudinal studies based on nationally representative samples, and the failure to consider individual preferences in living arrangements, relationships with adult children, the type, amount and intensity of intergenerational support, social participation status, and urban-rural differences when examining this relationship. In the following analysis, therefore, I will take full consideration of the above-mentioned cases to provide a systematic and comprehensive study of the relationship between living arrangements and the well-being of Chinese women aged 60 and over.

1.4 Research aims and questions

With these aims in mind, the research question for this thesis is: how do living arrangements affect the well-being of women aged 60 and over in China? In order to conduct thorough research on this question, this thesis will start with the following sub-questions:
R1: What is the well-being of women aged 60 and over in China and how is it measured?
This question focuses on the lack of clarity in the definition of well-being in the previous literature. This study attempts to establish an important foundation for the subsequent analysis by having a clear and distinct perception of well-being among women aged 60 and over in China.

R2: After controlling for other influencing factors, how do living arrangements affect the level of well-being of Chinese women aged 60 and over?
   R2-1: After controlling for other influencing factors, how do living arrangements affect the overall level of well-being of women aged 60 and over in China? Are there urban-rural differences in this effect?
   R2-2: After controlling for other influencing factors, how do living arrangements affect different dimensions of well-being among women aged 60 and over in China? Are there urban-rural differences in this effect?

This question is designed to fill a gap where the relationship between living arrangements and the well-being of women aged 60 and over is unclear. It will be examined using longitudinal analysis and data from a nationally representative sample in an attempt to capture greater demographic heterogeneity.

1.5 Summary
This thesis focuses on the relationship between living arrangements and the well-being of women aged 60 and over. This chapter first focused on the reasons for studying this topic in section 1.2. By reviewing state-induced socio-economic transitions, gender-blind social security policies, and changing life circumstances, it highlights the situations in which these women may face the challenge of declining levels of well-being. The vulnerability of their condition needs to be brought to the attention of society and government in order to push those powers to find solutions to this problem. Having identified the importance of the research topic, this chapter provides an overview of the current research. A systematic review of the relevant
literature based on the research topic of the thesis is presented in section 1.3. The review reveals that there is still a gap in the current research on this topic. The impact of living arrangements on the well-being of this group of women is unclear and there is an urgent need for research to fill this gap. In the subsequent section 1.4, the research questions and aims of the thesis are explained in their entirety. The two main questions that this thesis focuses on are: the definition and measurement of well-being of women aged 60 and over in China, and what the relationship between living arrangements and this group of women actually is. In the following chapter, I will discuss the first question of this study, which is the definition and measurement of well-being of women aged 60 and over in China.
Chapter 2 Conceptualising and measuring Chinese women aged 60 and over's well-being

2.1 Introduction

Before examining the relationship between Chinese women aged 60 and over's living arrangements and well-being, an important concept that needs to be clarified is determining the well-being of Chinese women aged 60 and over and how their well-being is measured. This chapter therefore focuses on these two issues. The chapter begins by answering the question of what women aged 60 and over’s well-being is in section 2.2. As there is no single definition of well-being, this section focuses on the current academic understanding of well-being. By introducing what well-being is and exploring the relevant factors that influence the understanding of well-being and the capability approach to understanding well-being, some ideas on how to determine and conceptualise the well-being of women aged 60 and over in China are presented. Subsequently, in section 2.3 of this chapter, the focus is on the issue of how to measure the well-being of women aged 60 and over in China. Section 2.4 then gives a summary of the chapter.

2.2 Understanding Chinese women aged 60 and over’s well-being

2.2.1 What is well-being?

What constitutes well-being has been an everlasting topic. Early measures of well-being were based on the economic dimension, where well-being was defined as the possession of economic resources (Austin, 2018). Therefore, indicators related to economic resources such as GDP (Gross Domestic Product), income and wealth were often used when measuring well-being at the national level as well as at the individual level (Austin, 2018). However, GDP at the national level is not a reliable
indicator of national well-being (Austin, 2016; Stiglitz et al., 2009), nor are the economic resources available at the individual level sufficient to achieve a good and prosperous life (Austin, 2018). Consequently, the understanding of well-being as a mere possession of economic resources has come under constant criticism from scholars, leading to intense debate on what well-being is within the disciplines of economics, psychology, political science and sociology, among others.

Scholars hold different views on the understanding of well-being. One group of scholars takes a subjective perspective and views well-being as a subjective feeling that people have about their lives (e.g. Diener, 2009; Taylor, 2015). The other group of scholars, on the other hand, takes an objective perspective and sees well-being as a measure of different objective dimensions of people's lives (M. T. Lee et al., 2021; Voukelatou et al., 2021). Simultaneously, within these two different perspectives of understanding well-being, there are also ways of understanding well-being from different foci.

Among the subjective perspective-based approaches, there are two dominant approaches to understanding well-being and they are the hedonic and eudaimonic approaches. Of which, the core of the hedonic includes an affective component (high positive affect and low negative affect) and a cognitive component (satisfaction with life or a particular area of life) (Diener et al., 1999, 2018; Schimmack, 2008). The affective component in understanding well-being focuses on happiness in terms of the overall balance of pleasure and pain in one's life (Fredrickson & Losada, 2005; Kahneman, 1999; Kahneman et al., 2004). The cognitive component in understanding well-being, on the other hand, considers happiness as a cognitive concept measuring people's satisfaction in terms of the individual's evaluation of their overall life or a specific domain (Schwarz & Strack, 1999; Wren-Lewis, 2015). Eudaimonic well-being, on the other hand, differs from the above two ways of understanding well-being in that it does not focus on particular hedonic or cognitive
outcomes, but rather focuses more on depicting how people live their lives (Eichhorn, 2012), such as their sense of growth, purpose, self-acceptance, self-determination and autonomy (Keyes et al., 2002; Ryan & Deci, 2001; Ryff, 1989).

Among the approaches based on an objective perspective, the “Objective List” theory is one of the more frequently used approaches. A variety of different components are specified, which together constitute the good of human life (Finnis, 2011). Alternatively, the 'Capabilities Approach' is often seen as a strong competitor in the objective perspective understanding of well-being. It is an understanding of well-being based on an individual’s ability to achieve a variety of valuable “functionings”, focusing more on what a person can do or become (Nussbaum, 2000; Nussbaum et al., 1993; Sen, 1980).

However, the 'Capability Approach' can be seen as both an objective and a subjective theory when it comes to measuring an individual’s capabilities. The former seeks to clarify which functionings and capabilities are valuable and essential to well-being, similar to an objective list (Taylor, 2018). The latter, on the other hand, favours an understanding of well-being determined by the preferences of individual subjects (Taylor, 2015). Overall, the capability approach is an encapsulation of both subjective and objective perspectives on understanding well-being.

2.2.1.1 Clarifying concepts related to well-being

Happiness, life satisfaction, standard of living and quality of life are often used interchangeably with well-being in some studies (OECD, 2013). There are commonalities between well-being and these terms as they all include an assessment of life (Age UK, 2017). However, the concept of well-being is not entirely equivalent to these terms. Therefore, before moving into a detailed discussion of the conceptual understanding of well-being, the concept of these terms needs to be clarified in order to have a clearer and more accurate understanding of the concept of well-being.
Firstly, the term happiness is often not explored in depth because it is too broad (Diener et al., 2017). Happiness can reflect the extent to which a person perceives their life quality (Voukelatou et al., 2021). Because subjective well-being includes people's cognitive and emotional evaluations of their life satisfaction, happiness is often considered similar to subjective well-being and is often conflated (Diener, 2009). For example, for researchers who tend to use subjective measures, subjective well-being is defined as a more scientific term compared to happiness, even representing the same meaning in the text (Kahneman, 1999).

However, other scholars have criticised the two as being completely different: happiness reflects people's emotional attitudes towards life (Taylor, 2018). People show happiness when they are emotionally positive or very satisfied with their current life situation. When a person feels happy, they experience pleasure more than they experience pain (Parducci, 1995). So, a clear distinction between happiness and well-being is that well-being is not always influenced by whether the person's life situation gets better or worse in the short term, but relatively, it is a more objective criterion of judgement. That is, well-being tends to be lower when one's situation is bad in the long-term, yet there may be higher short-term happiness due to short-term improvements in life situations (Taylor, 2018).

In addition, happiness is an important condition that leads to higher levels of well-being, but it is clearly not sufficient to be achieved through happiness alone. It requires a combination of other objective factors. Although the two are correlated over time or when happiness is sufficiently intense, transient happiness is not representative of a person's long-term level of well-being (Raibley, 2012).

Life satisfaction, a dimension in cognitive well-being as a way to measure subjective well-being, belongs to the same cognitive category as domain satisfaction, which is a
cognitive evaluation of people’s own standard of living (Jivraj et al., 2014; Schimmack, 2008). Well-being covers more than life satisfaction, as well-being includes both subjective and objective components.

The standard of living refers to the combination of wealth, services, comfort and material goods that are considered essential for people to live (Fah, 2010). This is a measure of well-being at the material level, which reflects a dimension of objective well-being. Well-being is a multidimensional concept and contains objective and subjective components (Bai & Gu, 2018; Decancq et al., 2015; OECD, 2020; Stiglitz et al., 2009).

Quality of life is a concept that is most similar to well-being. It refers to comfort, amenities, spiritual enjoyment and pleasure (Xu et al., 2022). It also contains both subjective and objective components, but on the subjective side it is an individual’s subjective assessment of each of the main areas of their life, such as satisfaction with self, family life, friends, health, finances, housing situation and activities (Gabriel & Bowling, 2004), and on the objective side it reflects a wider range of well-being (Fleuret & Atkinson, 2007; Lawton, 1983). Thus, some differences between it and well-being remain.

In summary, these four concepts are different and should not be confused. To avoid ambiguity, other terms are not used interchangeably with well-being and only well-being is used in this thesis. The next section will discuss the different understandings of the concept and how they compare and contrast with each other.

2.2.1.2 Subjective well-being

2.2.1.2.1 Affective well-being (AWB)

As an important component of hedonic well-being, a fundamental characteristic of the affective experience is its degree of pleasantness or unpleasantness. It defines an
individual's level of well-being by synthetically evaluating negative and positive emotions across all of one's experiences (Eichhorn, 2012), i.e. the preponderance of pleasant over unpleasant feelings (Fredrickson & Losada, 2005; Kahneman, 1999; Kahneman et al., 2004). Researchers typically assess the person's AWB by asking how often the respondent experiences specific emotions, e.g., happiness, joy, contentment, sadness, anger, worry, etc. (Tov, 2018).

The advantage of this method is that it appears to yield a more objective picture of an individual's subjective level of well-being. It avoids distorted information and thus influences the evaluation of well-being (Parducci, 1995) by assessing the feelings generated at the time of the event rather than afterwards when recollections are made (Varelius, 2004). The corresponding problem, however, is that the assessment needs to be based on all information about pleasure and pain from all events experienced by the research target, which presents a great challenge to the observer's ability to gather information about the research target (Eichhorn, 2012). Furthermore, this method combines the experiences of pleasure and pain to take an average to assess levels of well-being. However setting a cut-off point for pleasure and pain is a very complex process and it is difficult to ensure that this cut-off point is objective and fair (Alexandrova, 2005). Not only that, but this average level of well-being is also influenced by the frequency and intensity of the experience of happiness. Tov (2018) uses an example to point out that a person's average level of well-being is difficult to judge purely from the intensity or frequency of one's emotions. It describes the emotional experiences of Ted and Joe: Ted experienced happiness every day of the week, but at a reduced intensity each time, whereas Joe experienced happiness on only two days of the week, but at a very high intensity. When judging an individual's average level of emotion through the frequency of emotional experiences, Ted's level of happiness was higher, whereas when using the intensity of emotional experiences to judge an individual's average level of emotion, Joe's level of happiness was higher.
In addition to this, although this emotion is an assessment of what happened instantaneously at the time, it is actually also an evaluation that is recalled afterwards (Kahneman, 1999). As time passes and the person's thoughts change, their instantaneous emotional appraisal of what happened at the time may also differ from their later emotional appraisal. For example, a prank on another person may constitute happiness at the time, but in retrospect it may turn into shame (Eichhorn, 2012), and thus the judgement of affective well-being may depend on the individual's subjective psychological state (Taylor, 2015). The retrospective emotions from the person may differ from the transient emotions generated at the time of the event, not only because retrospective emotions come from long periods of reflection and transformation, but also because they are much less intense than the transient emotions experienced at the time of the event (Eichhorn, 2012). Furthermore, from the fact that affective well-being is quite closely related to personality, cheerful and extroverted people are more susceptible to positive affective than introverted people and are more motivated to put themselves in pleasant situations, resulting in more pleasant emotional evaluations (Derryberry & Reed, 1994; Tov, 2018). Therefore, objective evaluations that are idealistically expected to be obtained through the person's retrospective emotions are not as accurate.

2.2.1.2.2 Cognitive well-being (CWB)

Another important component of hedonic well-being is the cognitive component. As affective well-being measures well-being through a composite rating of the emotions experienced in response to a particular event, it fluctuates with recent events (Eid & Diener, 2004). In contrast, cognitive well-being tends to be based on stable sources of information, such as an overall assessment of one's life and life domains, and involves a range of factors, including the specific criteria one uses to judge whether life is going well, and one's perceptions of specific domains (e.g. work, relationships, health) of life satisfaction rather than specific events or activities (Luhmann et al., 2012; Schimmack & Oishi, 2005). Cognitive well-being disfavours well-being as an instantaneous characteristic, preferring instead to treat it as a long-term satisfaction
(Veenhoven, 1984). Compared to affective well-being, which emphasises emotional evaluations when specific events occur, cognitive well-being is more stable over long periods of time (Eid & Diener, 2004).

There are two ways of conceptualising life satisfaction: the 'bottom-up' approach, which derives overall satisfaction from satisfaction with specific domains, and the 'top-down' approach, which influences life satisfaction through the stable characteristics of individuals (Headey et al., 2005; Lance et al., 1989). The two approaches to conceptualising satisfaction are in fact clearly related: overall well-being and domain-specific well-being are closely related. Ratings of satisfaction in particular life domains vary across cultures and different life stages. This ultimately affects how they rate their overall satisfaction. Specifically, similar to Maslow's hierarchy of needs theory, for a person to achieve high overall life satisfaction, they need to attempt to satisfy each of the sub-domains such as the basic needs domain, the social domain and so on (Maslow, 1981). Thus, the environmental factors that people are exposed to influence overall life satisfaction by affecting domain satisfaction (Loewe et al., 2014). In contrast, top-down approaches, in addition to emphasising the influence of individual factors on overall satisfaction, also argue that one's own characteristics and one's environment together influence life satisfaction (Brief et al., 1993; Heller et al., 2004).

Thus, although nominally called top-down, this approach actually takes into account the influence of contextual factors from 'below' that affect domain satisfaction (Erdogan et al., 2012). In addition, personality has a profound effect on an individual's overall satisfaction (Brief et al., 1993). This is because personality shapes an individual's preferences, which in turn leads to different evaluations of different domains of life satisfaction (Loewe et al., 2014). The areas that people consider important at different ages also vary. Young people, for example, may value the establishment of intimate relationships more and therefore may use the romantic
nature of intimate relationships as an important criterion when assessing their life satisfaction (Oishi et al., 1999). At the same time, cultural differences also have an impact on important areas of people's identity. People from different cultural backgrounds differ in the domains they consider important (Loewe et al., 2014).

As culture plays a non-negligible role in shaping one's values, attitudes and the goals one pursues (Hofstede et al., 2005; Kim, 1994), there are also differences in the importance people from different cultures place on different areas of life (Cantor & Sanderson, n.d.; Kasser & Ryan, 1996; Oishi et al., 1999). In East Asian cultures, past personal achievements often tend not to be given special consideration when evaluating life satisfaction as they are in American cultures (Heine et al., 1999; Markus & Kitayama, 1991), due to the fact that self-effacement and self-criticism and refinement are prized in East Asian cultures (Loewe et al., 2014; Markus & Kitayama, 1991).

Besides, domain satisfactions are correlated with each other, while domain satisfaction is correlated with overall satisfaction (Schimmack, 2008). More specifically, the assessment of overall life satisfaction is often influenced by important domains. The impact of important domains may influence the assessment of people's overall standard of living (Schimmack, 2008). Negative or positive changes in important life domains can lead to corresponding changes in overall living standards (Engle & Bless, 2017). Also, the relationship between domain-specific life satisfaction and overall life satisfaction is not monotonic. Overall life satisfaction also affects specific life satisfaction, thus creating a circular relationship (Schimmack, 2008).

Given that well-being is a complex subject to assess, and that affective well-being requires each threshold of pain and pleasure to be first specified and averaged for a comprehensive assessment, proponents argue that cognitive well-being circumvents the challenges and biases introduced by operationalising the influences (Frey &
Although survey assumptions for cognitive well-being are objectively stable, however, during actual data collection, the evaluations collected by the researcher can be influenced by the context in which the person is living, resulting in data on their life satisfaction being influenced by their domain-specific satisfaction (Schimmack, 2008; Schwarz & Strack, 1999). In other words, because researchers often do not have ready access to the person's satisfaction with different domains, cognitive well-being increases the impact of more readily available satisfaction ratings on the overall assessment of life satisfaction (Fujita & Diener, 2005; Schimmack & Oishi, 2005). Overall, cognitive well-being alone is not an adequate proxy for subjective well-being, as the person's assessment of their own life satisfaction is influenced by the situation they are in, their emotions at the time of making the assessment, and their personality, among other factors.

2.2.1.2.3 Eudaimonic well-being (EWB)

The philosophical perspective of personal development opportunities is also highly valued when measuring well-being, which is what eudaimonia emphasises as self-fulfilment (Waterman, 2008). Unlike hedonic well-being, eudaimonic well-being emphasises the element of personal growth, self-actualisation, and rejects the hedonic approach of measuring well-being with happiness and pleasure as the main criteria, and emphasises that the core of well-being should be closer to human potential, such as a sense of control over one's life (M. T. Lee et al., 2021; Ryan & Deci, 2001). Specifically, EWB emphasises the importance of looking beyond a person's psychological state of being, such as pleasure, to how they cope with life challenges (Joshanloo, 2016; Ryff, 1989).

Ryff & Keyes (1995) propose a multidimensional eudaimonic model that incorporates self-acceptance (accepting one's limitations), positive interpersonal relationships (developing and maintaining good interpersonal relationships), environmental mastery (meeting personal needs through control of the environment), autonomy (maintaining one's individuality and maintaining one's
authority and decision making in different contexts), the purpose of life (finding meaning in life), and personal growth (making the most of one's talents and abilities). The personal growth factor is central to this model (Keyes et al., 2002; E. Kim & Lindeman, 2020; Ryan & Deci, 2001; Ryff, 1989). Although this model has been proposed, there is no unified theory or methodology for understanding eudaimonic well-being (Disabato et al., 2016). Therefore, we are not sure that these frameworks provide a thorough understanding of what eudaimonic well-being means.

Thus, some scholars have argued that a combination of hedonic and eudaimonic approaches should be used to gain a more comprehensive understanding of well-being. For example, in the well-being model proposed by Keyes, hedonic, social, and psychological well-being are combined to provide a multidimensional measure of a person’s mental well-being (Keyes, 2002, 2007, 2013). Of these, hedonic focuses on measures of emotions about life events and satisfaction with life as encompassed by cognitive well-being and affective well-being; whereas psychological well-being focuses on measures of levels of inner fulfilment such as personal growth as encompassed by EWB (Joshanloo, 2016).

However, some scholars have argued that the hedonic and eudaimonic approaches are highly correlated and overlapping in their understanding of well-being and therefore should not all be included in the well-being framework. For example, in the past some studies have found a clear potential correlation between the components of hedonic and eudaimonic well-being as well as significant empirical overlap (Bobowik et al., 2015; Gallagher et al., 2009). However, other researchers argue that the size of the distinction between hedonic and eudaimonic well-being is not sufficient to distinguish the two in research from an empirical perspective (Kashdan et al., 2008). In a recent study comparing the differences between the two approaches, in response to previous findings that the components of hedonic and eudaimonic well-being are highly correlated, Joshanloo (2016) used an exploratory structural equation modeling (ESEM) based on a sample of 3,986 US adults, finding
that it may be because the components of hedonic and eudaimonic well-being are generated by the confirmatory factor analysis (CFA) model, and that the CFA model suffers from the problem of exaggerating correlations between factors. His study also found that: hedonic and eudaimonic factors are largely independent. Therefore, both hedonic and eudaimonic approaches may need to be regarded as two separate approaches in the conceptualisation of well-being.

2.2.1.3 Objective well-being

Since subjective well-being is subjectively guided and values personal emotions and preferences, at the same time subjective well-being does not provide an explanation for the rationality of personal preferences. This has led to problems with both “offensive and expensive tastes” (Austin, 2018). Specifically, when measuring subjective well-being, the inclusion of “offensive tastes” such as racists’ preferences for discriminating against people of a different race can lead to elevated levels of subjective well-being and misjudgements (Cohen, 1989). Furthermore, the issue of “expensive tastes” can also lead to misjudgements about levels of well-being. For example, in order to satisfy a rich person’s preference for an expensive food such as caviar, society would have to spend more money on the rich person compared to a poor person who is satisfied with cheap food (Austin, 2018).

Furthermore, subjective well-being is not affected by objective periods of social hardship (Crabtree, 2010; Veenhoven, 1989). In fact, however, people's well-being in areas such as living standards, opportunities to achieve goals, etc. does receive the impact of major social events such as the economic crisis (Austin, 2018). Therefore, relying on subjective well-being alone to evaluate well-being is not as accurate and comprehensive as it could be. Therefore, the use of objective methods to measure levels of well-being is also favoured by researchers. There are of course persistent voices questioning the application of objectivism to the study of well-being. Objective facts are thought to influence well-being through people’s subjective attitudes towards it (Railton & others, 2003). The counter-argument to this view
gives an example about two friends who are in a disagreement. Although their current subjective evaluation is negative, the friendship actually enhances the long-term well-being of the person concerned (Rice, 2013). Therefore, objective measures of well-being also need to be considered in the study. I will explore the commonly used theories in objective measures of well-being (the objective list).

2.2.1.3.1 Objective list

The first thing to clarify around the objective list is the definition of basic objective goods, which is also referred to as states of affairs (Rice, 2013). It refers not only to tangible objects, but also to things that are not physical but can be beneficial, such as relationships, achievements and the power to choose one's ideal life (Crisp, 2006). Objective lists are based on enumerative theories and explanatory theories. Enumerative theories pick out or enumerate objects that directly constitute well-being, explanatory theories, on the other hand, attempt to explain why particular objects (states of affairs) enhance well-being (Crisp, 2006). These two theories are often debated in the differences in explanatory perspectives, thus, there is no academic consensus on the theoretical definition of the objective list (Fletcher, 2015). The objective list emphasises the independence and irrelevance of attitudes. It suggests that the items specified on the list should be objects that are generally beneficial to all humans, and should not include particular objects that represent individual preferences (Fletcher, 2015).

The advantages of the objective list approach is that it coincides with objectivist judgements of well-being, that is, judgements of the role of particular states of affairs on well-being are based solely on an objective perspective rather than from people's attitudes towards it (Rice, 2013). It therefore seems more objective. Besides, the biggest problem with the theory of hedonism is the idea that one's desires should be good for the person themselves, but this is inherently problematic. Some things may be desirable, such as smoking, but they are not beneficial to individuals. Thus, the theory of hedonism has been criticised by scholars for having
"too many prudential items" because it does not limit the scope of desires (Rice, 2013), and has therefore should be treated with caution. Objective list theory, on the other hand, avoids this broad hypothesis of desire and emphasises a limited set of things that are good for people (Fletcher, 2016), illustrating more objectivity and thus promoted by scholars.

However, this theory is also subject to some controversy. Firstly, there remains no established basis for how to judge an object as good or bad. For example, because of the attitudinal irrelevance of the objective list theory, goods that people want to buy cannot be defined as good simply because they are desired. However, these goods may be beneficial to people because of other attributes. Currently, criteria for judging the objective list theory as objectively beneficial or harmful to people are still missing and its feasibility has been questioned (Scanlon, 1998).

Another criticism of the objective inventory theory is that it does not have a common basic feature that identifies all inventory items, in other words it does not have a clear list of goods or a principled method of identifying inventory items, and therefore we can be very arbitrary in the process of generating inventories (Rice, 2013). While this theory idealises that the items on the list are the only things that are beneficial to all, there is neither such a universal list nor a consensus criterion or method for finding these states of affairs. Thus, the 'objective list theory' is presented inconsistently in its practical use by different researchers, and care must be taken in using this approach.

2.2.2 Factors affecting the understanding of the concept of well-being
The well-being of a woman aged 60 and over usually depends not only on her individual characteristics (whether observed or unobserved, such as age, gender, personality, etc.), but also on the context in which she lives and the dynamics of their interaction. For example, the attitudes and behaviour of those around the woman aged 60 and over (husband, children, siblings, friends, neighbours, etc.), as
well as the wider environmental context, such as the social norms and policies in which she lives, and the culture of the country all influence her well-being to varying degrees. If the resources available to women aged 60 and over within the households are misrepresented and their embeddedness in the system (beyond the household) is ignored, then an understanding of their well-being is inaccurate. In this section, I explored these factors that influence the process of conceptualising the well-being of women aged 60 and over, which will subsequently guide the construction of the next conceptual framework of women aged 60 and over's well-being in China in section 2.2.4.

2.2.2.1 Individual characteristics

2.2.2.1.1 Personality

The level of an individual's subjective well-being that is influenced by personality traits has been demonstrated by many studies (e.g. Diener et al., 1999; Tellegen et al., 1988; Zheng, 2018). Several studies have found that extraversion tends to be more strongly associated with positive affective perceptions (DeNeve & Cooper, 1998), and this relationship is not only reflected in the results of the scale measures, but also in the increased levels of positive emotions when engaging in social activities (Clark & Watson, 1988). At the same time, findings of associations between neuroticism and areas of the brain that dispose of negativity and areas related to threat perception also suggest that negative emotion perception is more closely linked to neuroticism (Everaerd et al., 2015; Shackman et al., 2016).

In addition, people's life satisfaction are to some extent stable, not necessarily due to external factors, but also possibly due to their personality traits (Diener & Lucas, 1999). Specifically, people develop a stable baseline of life satisfaction over the years, which in turn contributes to their relatively stable cognitive well-being. This appears to be due to the role of stable temperament types or personality types in the person (Diener & Lucas, 1999). Therefore, the influence of personality traits
needs to be considered when understanding the well-being of Chinese women aged 60 and over.

2.2.2.1.2 Age

The relationship between age and an individual's level of subjectivity has also been found in many studies. Studies have shown that older and younger people tend to rate the level of subjective well-being in relation to themselves higher than middle-aged people (Blanchflower & Oswald, 2008; Dolan et al., 2008). This u-shaped relationship between age and subjective well-being reflects the fact that younger people may have higher expectations of their future, yet as they age, an increase in unmet expectations reduces their level of subjective well-being (Gunnell et al., 2017; Hobson & Maxwell, 2017). Older adults, on the other hand, have a higher tolerance for unmet expectations, in other words older adults’ ability to self-regulate their emotions and be positive about their current situation increases compared to their middle age (Carstensen et al., 2011). Therefore, when conceptualising the well-being of Chinese women aged 60 and over, we also need to be aware of the impact that age characteristics have on them.

2.2.2.1.3 Gender

Similarly, gender is also a factor that reflects differences in well-being across groups. For example, while improvements in rights may often be positively correlated with higher levels of individual well-being, a study by Graham & Chattopadhyay (2013) found different results. They found that improving gender rights may be associated with lower levels of well-being for women in the short term. Whereas, when gender equality is established over time, it can be associated with higher levels of women's well-being. Their research demonstrates that the level of women's well-being depends not only on human capital, but also on changes in female identity associated with labour force participation, and the balance of decision-making power within the household. It could see from here that women's gender identities are embedded in social contexts and that a better understanding of women's well-
being requires an understanding of the social context in which they are embedded and how they interact with each other. Next, I will discuss in detail how individual well-being is affected in social contexts.

2.2.2.2 Social context
The primary effect of social context on individuals is that they may lead to goals that differ from intrinsic motivations (Eichhorn, 2012). For example, the purchase of luxury goods is not a spontaneous motivation, but rather a comparison mentality influenced by those around. As a result, the well-being achieved may be lower than expected. Secondly, social context such as state institutions and social norms can influence individuals' control over their environment and have an impact on their well-being. For example, the construction of ageing and the retirement age is an example of a restriction of individual rights due to social contextual factors. Many scholars point out that ageing can be a problem because pension and health care expenditure may grow as the ageing population increases (Etzioni et al., 2003; Mafauzy, 2000; Smith, 2012). In addition to the increasing financial burden, a large number of people requiring long-term care could also place a burden on both formal and informal caregivers (Knickman & Snell, 2002). However, Spijker and MacInnes (2013) argue that ageing should not be a problem because being old does not necessarily equate to poor health. Because of the influence of the political and economic environment, ageing is considered a social problem. The massive expenditure on the ageing population is a burden for younger citizens (Powell, 2000). Such statements about the threat of the ageing population could be a strategy politicians use to reduce welfare costs and shirk responsibility for the population (Mullan, 2000).

From a social construct perspective, ageing may not be about people’s physiology; rather, it may be the result of interpersonal interactions in their daily lives. When people reach 60, they do not suddenly become weak and frail; that depends on the context and each person’s characteristics (Oppong, 2006; Samuels et al., 2018).
Studies on ageing should not focus on defining people by their age and then base themselves on the arbitrary concept of old age. Age is not the only factor causing problems for people in later life, but the way in which society views old age might be a crucial factor. Under the guise of applying disengagement theory, governments have legitimised regulations on who can and cannot participate in the labour market on the basis of age (Powell, 2000). People's income declines sharply after retirement and this decline inhibits their ability to feel secure in old age, hence the observation in some studies that people's well-being may be different before and after retirement age (Masud et al., 2008; Ofstedal et al., 2004; Yang et al., 2010).

Secondly, another example of a social context that affects individual well-being by limiting an individual's ability to control their environment is gender. A study based on Graham and Chattopadhyay (2013)\(^\text{13}\), found that an increase in gender rights may not increase women's levels of well-being in the short term, but may instead decrease them. The reason for this relationship may be, firstly, that it takes time for such new norms to be established and accepted, so that in the short-term, women's levels of well-being may fall, but in the long term they may rise. Secondly it may also be due to the fact that the positive relationship between the establishment of gender equality and levels of well-being is subject to structural constraints at both the macro and micro levels (Duflo, 2012). At the macro level, although progress has been made globally in gender equality work (Estes & Sirgy, 2017). However, recent research on gender equality shows that there are still many gaps in well-being between men and women of all ages, especially women in developing countries (Lijadi, 2018). At macro level, men remain powerfully dominant in politics and in influencing social norms, and at a micro level, promoting equality of rights does not fully ensure equal decision-making power for women within households (Graham & Chattopadhyay, 2013). Thus, equality of rights is constrained by the social context

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\(^{13}\) This study was also mentioned in the previous section 2.2.1.3. Here I focus on the reasons for the emergence of the study results.
and that simply promoting equality of rights may not be in line with the norms and expectations of the state and may increase the likelihood of women receiving discrimination, thereby reducing their level of well-being (Graham & Chattopadhyay, 2013). Therefore, when considering women's well-being, it is important to consider the constraining influence of social context, such as the potential negative response of all members of society to female empowerment.

In addition, culture as another social context should not be overlooked. Although people share a preference for pleasant emotions, different cultural backgrounds can lead to different interpretations of pleasant emotions. For example, because American cultural norms place more emphasis on individualism, including risk-taking, than East Asian cultures, Americans tend to prefer high-intensity pleasant emotions that are more exciting than Chinese people (Tov, 2018; Tsai et al., 2006). In addition, Western cultures emphasise individualism, while East Asian cultures emphasise collectivism. Thus, in some studies, American respondents were found to be more inclined towards the emotion of disengagement, while Japanese respondents were found to be more inclined towards the emotion of participation (Kitayama et al., 2000, 2006; Lee et al., 2021).

Not only that, but culture also influences people's values as well as their lifestyles, which may shape the way people evaluate their lives (Joshanloo, 2014; Oishi, 2018). Cultural differences between East and West can lead to different understandings of well-being between the two groups of people. For example, in Western cultures, individualism or personally expressed aspects of well-being (e.g., environmental control, self-esteem and self-actualisation) are given more weight, whereas in East Asian cultures, Buddhist and Confucian social theories occupy the core of understanding well-being (Joshanloo et al., 2021). It places little emphasis on pleasure and positive emotions and instead considers the perception of suffering in life and society as an important component of true well-being (Joshanloo et al.,
In summary, social context (individual life circumstances, state’s institutions, social norms and culture, etc.) need to be taken into account in understanding the concept of well-being.

2.2.3 An integrated approach: the Capability Approach (CA)

It could be seen from the above discussion that well-being is a multidimensional concept and that using a single dimension to understand well-being does not give a true picture of what well-being is. It is also important to understand well-being in relation to the individual characteristics of the study group and the social context in which they live. In order to gain a more comprehensive understanding of the well-being of women aged 60 and over in China, I will introduce the capability approach in the following section.

Capability approach (CA) tries to clarify which functions and capabilities are valuable and critical to well-being (Nussbaum, 2000), and as such, it argues that well-being should be considered in terms of functions and capabilities that combine individual characteristics as well as social context rather than mere resources and utilities (Alkire, 2016). CA culminates in a measure of well-being known as functionings. Functionings represent achievements that are generally valued as well as those that are valued by individuals (Alkire, 2016). This includes basic achievements such as having a healthy body and access to a safe living environment, which apply to most people, or high level achievements such as participating in the Olympics, which apply to some people, which can be seen as an aggregate of achievements, and in this sense, well-being is a summary index from a range of functions (Stiglitz et al., 2009).

The 'core human functional capacities' listed by Nussbaum (2000), for example, is an attempt to assess well-being by using generic human rights as well as political rights, for example, as a list of functionings that can accommodate individual differences. In terms of this generality and the inclusion of differences in populations, CA is relatively objective in understanding well-being.
Also, the CA approach does not deny a subjective understanding of well-being; it simply argues that subjective well-being alone is not a sufficient measure of well-being (Sen, 1980). In addition, Sen, an advocate of CA, recognises the importance of subjective well-being. He admits that being able to be well-off is also an achievement in itself, thus the ability to be well-off should be included in the framework of understanding well-being (Sen, 2008, 2009). For example, the same event can have different effects on the subjective well-being of individuals with different personalities, and even if an individual has sufficient objective resources, his or her attitude towards seeing things negatively may lead to a lower level of subjective well-being, which can be seen as a lack of ability to be well-off. Furthermore, Sen suggests that attention should be paid to the individual's freedom to achieve what he or she considers to be an ideal life (Sen, 1999). This in line with eudaimonic well-being, both of which emphasise the individual's control and choice of lifestyle. Therefore, CA is inclusive of the concept of subjective well-being (Alkire, 2016).

In terms of CA theory, the evaluation of an individual's well-being depends on the interaction of the individual's capabilities with the characteristics of the social context in which he or she lives (Sen, 1985). He provides an example of a woman's ability to achieve the function of independent mobility via a bicycle to explain how CA assesses an individual's ability to achieve the function by understanding the interplay of individual ability (mastery of cycling skills), social norms (allowing women to cycle) and environmental characteristics (roads that allow cycling). In other words, if an individual ultimately lacks the ability or loses the freedom to choose ability due to a lack of the above characteristics, then this individual is defined as deprived, or poor based on CA theory (Robeyns, 2005; Sen, 1993). Thus, CA focuses on those things that one “manages to do or be” (Sen, 1985, p. 10) in life, it focuses on poor or inferior well-being, and its parameters are related to the extent to which individuals are deficient on different dimensions of well-being (Halleröd & Seldén, 2013; Naidoo, 2019; Tomlinson et al., 2008).
Unlike theories that focus on achieving higher well-being through an idealised equal distribution of resources or increased welfare, CA emphasises a diversity of definitions of values related to well-being (Nussbaum, 2000; Sen, 1985), as individuals will have a diversity of understandings and emphases on valuable functionings that contribute to a good life (Austin, 2018). At the same time, this process of assessing an individual’s ability to achieve functionings also conceptualises well-being on the basis of individual needs, and therefore CA also forms a framework for assessing individual well-being that can be referenced (Austin, 2018).

However, in contrast to affective well-being, which focuses on emotions, and cognitive well-being, which emphasises subjective satisfaction, and eudaimonic well-being, which values behavioural motivation and control over life, CA incorporates both subjective and objective components. It therefore requires a higher level of information richness, which has led to indicators such as 'free disposal' being questioned by researchers due to the difficulty of obtaining exact observations (Srinivasan, 1994). However, CA as a theory for measuring well-being is gradually being adopted by more researchers as information collection methods are refined (e.g. Biggeri & Cuesta, 2021; Halleröd & Seldén, 2013; Naidoo, 2019).

Furthermore, criticism of CA also comes from the design of functional capabilities: giving abstract definitions of functions can be seen as lacking practical application (e.g. Rawls, 1999), while giving a concrete list, as Nussbaum (2000) does, has been criticised as anti-democratic (e.g. Barclay, 2003). However, the CA approach does not aim to give a fixed definition of well-being or a specific list, it focuses on developing a set of scenarios in relation to the characteristics of the research target, in other words, while it does not give a universal list, it gives a more reasonable way of conceptualising well-being. This approach allows people to understand well-being in
relation to different personal characteristics, social contexts. Because the understanding of well-being is not fixed and unique, the conceptualisation of well-being may vary. Therefore, it is unrealistic and unreasonable to seek a universal definition of well-being. Besides, the uniformity of the concept of well-being and the consistency of the list of goods should not be an obstacle to the use of this theory, as we can look for commonalities between these statements by taking into account the different factors that influence the concept of well-being while understanding it.

2.2.4 A conceptualisation framework for the well-being of women aged 60 and over in China

An exploration of the above approaches to understanding well-being reveals that well-being is a broad concept that cannot be fully understood by subjectivity alone or by objectivity alone. An understanding of well-being should be based on a multifaceted concept of well-being. The capability approach incorporates many concerns in well-being (subjective and objective components, personal characteristics, and social context) into a complete conceptual framework. It enhances our understanding of the nature of women aged 60 and over's well-being by shifting the primary focus from the means to the ends pursued by the individual (Biggeri et al., 2006), and the freedom to be able to satisfy those ends (Sen, 1999). Also, this approach goes beyond the resource-based approach (Rawls, 1971), as personal resources do not necessarily equate to (and do not necessarily convert into) individual functionings (Biggeri & Cuesta, 2021).

Understanding women aged 60 and over's well-being in China is therefore guided by a capability approach and a conceptualisation framework is constructed correspondently (see Figure 2-1). In the framework, women aged 60 and over's well-being is a collection of functionings that contain both subjective and objective components. The fulfilment of these functionings is influenced by the resources and capabilities that women aged 60 and over possess, as well as their personal
characteristics and social context. The resources that women aged 60 and over possess do not directly reflect well-being but are linked to it by their capabilities. In other words, whether or not women aged 60 and over have the ability and the freedom to use this ability determines whether or not the resources they possess are converted into well-being. Women aged 60 and over's capabilities are influenced by the individual characteristics of women aged 60 and over, and because women aged 60 and over are embedded in a social context. Therefore, their ultimate well-being is also conditioned by the social context.

Figure 2-1 Understanding Chinese women aged 60 and over's well-being

There are two advantages to using this approach in understanding the well-being of women aged 60 and over in China: firstly, it helps to separate older Chinese women's outcomes (achieved functions) from their capabilities (opportunities to function) and the availability of resources (resources/inputs). Secondly, it explains the process of linking resources (resources/inputs) to older Chinese women's capabilities (opportunities) and achieved functions (outcomes) and describes how these are mediated by the individual, social context specified in the capability approach.
However, there may be measurement difficulties in applying the framework. Most household questionnaires may not contain enough information to fully implement the framework, but this should not be a reason to abandon it: questions that in the past seemed too technically difficult or too sensitive to ask are now collected on a systematic basis (Biggeri & Cuesta, 2021). This can be used as an empirical guide in understanding the concept of well-being, particularly in relation to the well-being of women aged 60 and over in China.

2.3 Measuring Chinese women aged 60 and over’s well-being

The exploration in section 2.2 revealed that well-being is a multidimensional concept, and therefore the choice of its dimensions and the indicators that respond to them is a crucial aspect when measuring well-being. Therefore, this section focuses on the issue of how to select dimensions as well as indicators to measure the well-being of women aged 60 and over in China.

There are two popular approaches to the selection of dimensions and indicators. The first approach can be seen as a top-down approach (e.g. Gao, 2019; Naidoo, 2019), in which dimensions of well-being and indicators are selected by reviewing the past literature and combining it with research on the understanding of well-being. The advantage of this approach is that the framework for measuring well-being is not based on data, but on concepts, theories and characteristics of the study group, and is therefore more realistic in terms of the well-being of the group being measured. The disadvantage, however, is that in practical application, there may be a lack of variables in the data to measure well-being.

The second approach can be seen as a bottom-up approach. It begins by reviewing elements of well-being in the wider literature to identify as many indicators of well-
being as possible that have been used in the previous literature, then using structural equation modelling (SEM)\textsuperscript{14} to filter out important indicators based on the data, and then aggregating these indicators into different dimensions based on multivariate data reduction techniques\textsuperscript{15}. This type of approach is also present in a large number of studies (e.g. Age UK, 2017). The advantage of this is that since the measurement framework is derived from the data, there is no risk of not having variables in the data to apply the measurement framework in practice. However, there are some problems with this approach, firstly, a significant investment of time and money may be required in the initial collection of indicators. In order to ensure that the final measure of well-being is comprehensive and accurate, indicators need to be collected as comprehensively as possible. This is a challenging approach given the time constraints of doctoral study. Secondly, as the final selection of indicators and aggregation of dimensions is derived from the data, the reliability of the measurement framework may need to be treated with caution. The question of

\textsuperscript{14} Structural equation modelling is a technique that combines regression and confirmatory factor analysis. It allows the researcher to use several indicators to measure an independent or dependent variable. A set of indicators can be used to measure a broader concept given the measurement error (Kuklys, 2005). Structural equation modelling allows the researcher to assess the overall fit of the model while conducting factor analysis and to explicitly deal with measurement error (Chiappero-Martinetti & Roche, 2009).

\textsuperscript{15} Multivariate data reduction techniques make it possible to reduce a large number of variables to a small number of aggregated variables by analysing the interrelationships between a large number of indicators and understanding their underlying structure. Such techniques include factor analysis, principal component analysis, multiple correspondence analysis and cluster analysis. They have the advantage of being highly reducible to the data, producing models that measure well-being and indices of aggregated variables to facilitate the calculation of overall levels of well-being. The weighting structure is derived directly from the data, avoiding the problem of arbitrary assignment of weights (Berenger & Verdier-Chouchane, 2007; Klasen, 2000; Maasoumi & Nickelsburg, 1988).
whether the measurement framework derived from the data is representative of the well-being of the group is a concern. This is because if the data used is inaccurate in its collection and is not a good representation of the group to be studied, then the framework will not accurately reflect the true well-being of the group. As such, some scholars have criticised it for potentially failing to reflect the true model of well-being (Mazziotta & Pareto, 2019; Phan et al., 2019).

Given the two reasons explored above, I believe that the measurement framework should not be generated based on data collected, but should be constructed based on understanding of well-being and reflect a true measure of women aged 60 and over’s well-being. Of course, by using this approach it is likely that there will be situations where certain important dimensions and indicators are not present in the data and therefore cannot be measured, but this should not be a reason to prevent us from constructing a measurement framework that can provide a more objective response to women aged 60 and over’s well-being. It can provide aspects that can guide future research and data collection, facilitating more refined data collection and related well-being research. Therefore, in this thesis, I adopt the first approach to construct a well-being measurement framework for women aged 60 and over in China. Thus, in the following pages, I review some of the relevant studies on well-being measurement in recent years, especially for people aged 60 and over, and identify some common dimensions of well-being measurement by reviewing their methods. The dimensions of women aged 60 and over’s well-being in China were then selected based on the understanding of the concept of women aged 60 and over’s well-being discussed in Section 2.2. Indicators were then selected based on the definition of each dimension and recommendations from the relevant literature.

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16 As measurement frameworks specific to women aged 60 and over’s well-being are even more rare at present, the review of the literature also heavily incorporates research on measurement frameworks for people aged 60 and over’s well-being.
Finally, the developed framework for measuring women aged 60 and over in China is critically reviewed.

2.3.1 A literature review of the well-being measurement framework for people aged 60 and over

Among the national-level measurement frameworks that specifically address the well-being of people aged 60 and over is the “Healthy Ageing Approach” developed by the World Health Organisation (WHO, 2002). It uses the “Active Ageing Index (AAI)”, which consists of 22 indicators in four dimensions, including indicators that measure employment-related rates across age groups; indicators that measure social participation, including voluntary activities, political participation, etc.; indicators related to the degree of health and safety in life, capabilities and supportive environments (including mental health and social connections) to measure the well-being of people aged 60 and over at the national level (Pantelaki et al., 2021).

Secondly, there is Age UK’s “Index of Well-being in Later Life” (IWLF) (Age UK, 2017). It measures the well-being of the older population along five dimensions: the personal life dimension covers living arrangements, family status, care and help, intergenerational connections and thinking skills; the social dimension includes indicators such as creativity and cultural engagement, as well as communities and friendships; the personal health dimension includes physical and mental health, mental health, long-term illness or disability, and physical activity; the resources dimension, which includes indicators of personal wealth such as employment status, income, pension income, finance, home ownership and social resources such as satisfaction with health, leisure, public transport and shopping services, measures the well-being of people aged 60 and over at the national level.

Besides, some Chinese scholars have also developed a framework for measuring the well-being of people aged 60 and over in China at the national level (Yang et al.,
This framework includes economic well-being, which focuses on disposable income per capita, social well-being, which focuses on the ownership of social service resources per capita, and ecological well-being, which focuses on the ownership of natural resources per capita.

National-level-based measures of people aged 60 and over’s well-being focus on the overall situation of people aged 60 and over as a group given national averages and can provide a perspective for identifying social problems within people aged 60 and over’s groups and inform policy makers in developing relevant policies. However, the method of assessing overall well-being by calculating national-level averages does not accurately answer what individual well-being actually is (Naidoo, 2019). In other words, although per capita well-being at the national level may be high, there are many people with low well-being that are hidden by this average. For example, a wealthy person may have the amount of resources of ten poor people and have a relatively high level of well-being, while those ten poor people who are deprived of resources generally have a low level of well-being. However, the average level of well-being for these eleven individuals may be high. Measuring well-being at the individual level therefore needs to be distinguished from measuring well-being at the national level.

Given the distinction between individual-level well-being and national-level well-being measures, there is a need to draw more on individual-level well-being measures in my research rather than confusing national-level and individual-level well-being measures. In reviewing the literature on individual-level well-being measures for people aged 60 and over, it was found that some studies focus only on the subjective well-being of the individual older person. For example, (Elkins et al., 2020) use overall life satisfaction to measure the individual level of cognitive well-being of people aged 60 and over and the Kessler Psychological Distress Scale (K6); a Likert scale to measure anxiety and depression. Other studies have measured the
subjective well-being of people aged 60 and over by comparing different measures of subjective well-being. For example, in the study by (Jivraj et al., 2014), they used a 15-item revision of the CASP-19\textsuperscript{17} scale developed by (Wiggins et al., 2008) to measure eudaimonic well-being; Satisfaction with Life Scale (SWLS) developed by (Diener et al., 1985) to measure cognitive well-being, and a shortened version of the eight-item of the Center for Epidemiologic Studies-Depression (CES-D) scale (Radloff, 1977) to measure affective well-being.

In some frameworks that include both subjective and objective components to measure the well-being of people aged 60 and over, education, economics, health, social participation, interpersonal relationships, personal capability/autonomy, and social environment are seven dimensions frequently included in the measurement framework. For example, the World Health Organisation’s (WHO) broader quality of life measure, the WHOQOL-OLD (Power et al., 2005), includes dimensions such as sensory ability, autonomy, and social participation. There is also a framework for measuring quality of life for people aged 60 and over (OPQOL). It includes eight dimensions such as general life, health and social relationships and participation (Bowling, 2009). In addition, a measurement framework for the well-being of older Australians includes economic stability, physical health, mental health, relationships, social engagement and neighbourhood environment (Naidoo, 2019).

However, not all of these dimensions are applicable to measuring the well-being of women aged 60 and over in China, and thus we should filter the dimensions that are most appropriate for this study in relation to our understanding of the concept of well-being of women aged 60 and over in China discussed in section 2.2. Next, I will elaborate on the dimensions that should be included and excluded from the measurement framework for women aged 60 and over in China.

\textsuperscript{17} This is a self-enumerated scale of quality of life (CASP-19).
2.3.2 Selection of dimensions

Alkire (2002) suggests four principles for selecting dimensions, namely ‘incommensurable’, which means that two dimensions should not overlap in terms of indicators; ‘irreducible’, which means that a dimension cannot be further split; ‘non-hierarchical’, which means that dimensions are hierarchically equal to each other; and ‘valuable’, where the dimensions themselves either constitute elements of well-being or influence elements within well-being. The first three of these four principles can be used as guidelines in our selection of well-being, but the last point of ‘valuable’ needs to be used with discretion. In terms of dimensions related to the measurement of well-being, we need to distinguish between whether these dimensions are factors that influence the outcome of well-being (which is not itself part of well-being, but which may be a reliable means of achieving it or otherwise contributing to it, such as social participation (Taylor, 2015) or whether they are components of well-being itself (which fully or partially constitutes well-being, such as health(Søraker et al., 2015). This is because the inclusion of both constituent and influencing factors in the framework results in a situation where influencing factors act on multiple constituent elements of well-being, thus violating the principle of ‘incommensurable’ in the selection of dimensions. This puts the measurement of well-being at risk of being unbalanced in terms of weight. For example, social participation makes people aged 60 and over physically and psychologically healthier (Buffel et al., 2014; De Donder et al., 2012; Pollack & von dem Knesebeck, 2004; Sirven & Debrand, 2008; Young et al., 2004), and including both in the framework would result in an overweighting of physical health and mental health, thus affecting the objectivity of the well-being measure.

Secondly, from the discussion in section 2.2 we can gather that based on the concept of Capability Approach, well-being is a collection of functionings (Stiglitz et al., 2009). Therefore, we need to be clear that the functionings are the direct measure of well-being, and that other influences such as resources, capabilities,
personal characteristics, social context, etc., should not be included in a direct measure of well-being. Therefore, this study selects dimensions in terms of what constitutes the concept of well-being. In other words, only elements that constitute well-being are considered in the measurement, while elements that influence a particular dimension of well-being are not considered. In the final framework for measuring the well-being of Chinese women aged 60 and over, only three dimensions were retained: economic well-being, physical well-being and mental well-being. Dimensions affecting well-being such as education\textsuperscript{18}, social participation\textsuperscript{19}, personal relationships\textsuperscript{20}, personal capability/autonomy\textsuperscript{21}, and social environment\textsuperscript{22} were excluded. This is because firstly they are all factors affecting well-being rather than components of well-being and secondly, they can affect components of well-being, creating a problem of weighting imbalance.

It is also important to note that the economic dimension is a controversial dimension, as it can be both a component and an influencer of well-being. This is because the economic dimension does not only reflect people's economic level, but

\begin{flushright}
\textsuperscript{18} Due to the cumulative effect of education, people aged 60 and over who have higher levels of education often have higher levels of well-being (Liu \& Sun, 2018).
\textsuperscript{19} Numerous studies have demonstrated the effect of social participation on people aged 60 and over. Not only does it reduce the risk of mortality and morbidity (Berkman et al., 2000; Veenstra \& Patterson, 2012), but it also makes people physically and psychologically healthier and leads to a better quality of life (Buffel et al., 2014; De Donder et al., 2012; Pollack \& von dem Knesebeck, 2004; Sirven \& Debrand, 2008; Young et al., 2004).
\textsuperscript{20} Personal relationships such as family relationships and friendships influence subjective well-being from childhood onwards (Goswami, 2012). In addition, personal relationships also influence health by promoting healthy habits and providing social support (Garcia et al., 2016).
\textsuperscript{21} As can be seen in the conceptualisation framework in section 2.1, individual capacity/autonomy is an important means of achieving functionings. Resources achieve functionality through individual capacity and the freedom that individuals have to use this capacity. For women, empowerment embodies women’s personal capability/autonomy, which enables women to achieve and be free to achieve their ideal life, which is closely linked to the overall experience of well-being (Kabeer, 2001) and is an important factor influencing the achievement of well-being.
\textsuperscript{22} The influence of the social environment, such as the individual’s surroundings, social institutions, norms and culture on individual well-being is discussed in detail in section 2.1. These are all influences on well-being.
\end{flushright}
it is also a necessary means of providing individuals with a good life, i.e., it has an enhancing effect on individual health (Naidoo, 2019). However, previously reviewed studies on multidimensional well-being generally include the economic dimension, and its exclusion from the list of dimensions that constitute well-being would compromise the integrity of the composite well-being index, as it includes the most important (and measurable) component of well-being, namely the ability to access the natural, social resources needed to achieve the function of living well. For this reason, in this study, the economic dimension was included in the measurement framework.

Another thing to note is that the physical and mental well-being dimensions are treated separately within the framework of well-being measurement for women aged 60 and over in China. According to the definition of health advocated by the World Health Organisation, ‘health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’ (World Health Organization Interim Commission, 1946, p. 100). In other words, health is considered to be a multifaceted phenomenon. Therefore, the physical and mental well-being dimensions are treated separately and this is also consistent with the approach in the studies of Ware & Kosinski (2001) and Naidoo (2019).

Finally, according to the conceptual framework of well-being of older Chinese women constructed in section 2.2, each dimension of well-being of Chinese women aged 60 and over is inclusive of both objective as well as subjective components. That is, the assessment of subjective and objective aspects of well-being is best presented separately under each dimension. This will allow subjective assessments to provide a concise counterpart to the objective measures under each dimension, thus facilitating both subjective and objective assessments under each dimension. Ultimately, this study will use economic well-being, physical well-being and mental well-being to construct a framework for measuring women aged 60 and over's well-
being in China. These three dimensions are described in Table 2-1.

Table 2-1 Dimensions of well-being of women aged 60 and over in China

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic well-being</td>
<td>This dimension reflects the role of the combination of resources and capabilities on an individual's economic level. It largely influences the extent to which individuals' standard of living matches their expectations, while encouraging people to pursue what they perceive as valuable and allowing them to maintain that lifestyle (Chan et al., 2002; OECD, 2013; J. Thomas &amp; Uguccioni, 2016). It is an important aspect of well-being.</td>
</tr>
<tr>
<td>Physical well-being</td>
<td>This dimension is concerned with the physiological state of the individual, i.e. the impact of physical functioning and health limitations on the ability to enjoy and maintain one's lifestyle (Ware &amp; Kosinski, 2001). It is a fundamental aspect of well-being as it determines the quality and length of life (Stiglitz et al., 2009).</td>
</tr>
<tr>
<td>Mental well-being</td>
<td>This dimension encompasses the mental and emotional state of the individual, recognising its work on the individual's ability to maintain their lifestyle (Peel et al., 2004).</td>
</tr>
</tbody>
</table>

Source: Author constructed.

2.3.3 Selection of indicators

Next, I will identify indicators that adequately represent each dimension of well-
being. A consensus in the selection of indicators is that each individual indicator on its own may not fully reflect the dimension it refers to, and that it needs to reflect a complete dimension together with other indicators (Frønes, 2007; Maggino & Zumbo, 2012). Therefore, there may not be a single indicator under each dimension. Secondly, selected indicators can also be used, have value, can be interpretable and are statistically robust (Atkinson et al., 2002). Based on this set of principles, the selection of indicators for the three dimensions selected above (physical well-being, mental well-being and economic well-being) was done by primarily considering which indicators had been used in previous studies to represent these dimensions, as the indicators repeatedly used in previous studies had been shown to meet the characteristics of being usable, valuable, interpretable and statistically robust in practice. Furthermore, as some of the more commonly used indicators in research are also more controversial, the selection of indicators has to be used in the context of the study. The selection of indicators is described below.

The first indicator to be selected is based on a physical well-being dimension. Previous studies have typically used indicators such as self-rated health, functional impairment, and chronic illness to measure this dimension (Carmel, 2019; Chen & Leu, 2020; Naidoo, 2019). Where self-rated health captures the subjective component of the dimension of physical well-being, while functional impairment, and chronic illnesses respond to the objective component of this dimension. Also, these indicators capture characteristics such as physical functioning and health limitations, which is in line with the definition of this dimension in section 2.3.2. Therefore, in this study, the choice of indicators for physical well-being were also aligned with these studies.

Regarding the choice of indicators for the measurement of mental well-being, this study referred to two indicators commonly used in previous studies, depressive status and perceived mental well-being (Carmel, 2019; Gildner et al., 2019; Hou et
Whereas depressive status reflect the objective component of the mental well-being dimension, perceived mental well-being is an assessment of an individual's coping resources, such as self-esteem, self-efficacy, resilience and sense of cohesion, focusing on the subjective component of responding to well-being (Carmel, 2019). Together, these indicators reflect what is meant by mental well-being as discussed in section 2.3.2, i.e., the mental and emotional state of the individual.

When assessing the economic well-being; income, wealth, social welfare, standard of living, consumption, and subjective economic well-being are often used as indicators to respond to this dimension (Brown et al., 2018; Browning et al., 2013; Calvi, 2019; Hu, 2019; Joo & Grable, 2004; Kahneman & Deaton, 2010; Li et al., 2011; Li et al., 2019; Peng, 2019; Xu et al., 2019). However, in this study, only two indicators, wealth and subjective economic well-being, were included in the economic dimension and the rest were not considered. A new indicator, informal work, has also been included in this dimension. The reasons for the selection of particular indicators will be explained below.

The first point to be made is that some of the indicators in the economic dimension are different from the indicators in the physical and mental well-being dimensions. The indicators on the physical and mental well-being dimensions assess the state of the individual at the individual level. Some of the indicators on the economic dimension, however, assess the state of the individual at the household level, and therefore it relies on the ‘equal sharing theory’. This theory assumes that ‘all members of a given household receive an equal share of disposable income’, or that they receive resources according to their specific needs (Nygård et al., 2017, p. 684). However this theory has been challenged by many scholars who argue that it does not reflect a person's true economic well-being (Asfaw et al., 2010; Bessell, 2015; Bradshaw, 2013; Bradshaw et al., 2017; Chant, 2008; Pogge & Wisor, 2016;
Much empirical evidence suggests that the distribution of resources within households does not conform to the assumption of ‘equal sharing’, but depends on bargaining power (Alderman et al., 1995; Aronsson et al., 2001; Browning & Chiappori, 1998; Espinoza-Delgado & Klasen, 2018). Women therefore tend to have lower bargaining power due to the lower value of their contribution to the household, and therefore only receive a smaller share of the resource allocation (Agarwal, 1997; Arber, 2006; Doss, 2006b; Duflo, 2003b; Espinoza-Delgado & Klasen, 2018; Price, 2003b; Quisumbing & Maluccio, 2003b; Vijaya et al., 2014; Zaidi, 2010b). Therefore, using household-level indicators to represent individual-level indicators for women aged 60 and over may overestimate the level of economic well-being of women aged 60 and over. Therefore, we need to make a strict distinction between the two when selecting indicators. Of the six indicators commonly used to represent the economic dimension described above, some measure the individual economic dimension at the household level, which includes wealth, standard of living and consumption. Others measure individual economic dimensions at the individual level, such as subjective economic well-being. Still others include both household and individual measures, such as income and social welfare. I will explain each of these indicators below.

2.3.3.1 Indicators at the household level

2.3.3.1.1 Wealth

Wealth reflects a person’s economic sustainability, including their assets, investments, land and property (OECD, 2013). It affects economic well-being and provides a safety net during economic crises, allowing owners to sell or pawn their assets (Carter & Barrett, 2006; Vijaya et al., 2014). Those individuals who are 'asset rich and income poor' are expected to experience a higher standard of material living than their income itself would suggest (OECD, 2013). This can be interpreted as the current state of resource ownership and the reserve of resources to ensure future economic security, which better reflects the economic well-being of people aged 60
and over (Cruz, 2019). However, in questionnaire collection, wealth information is often collected on a household basis, making it difficult to accurately distinguish individual wealth from household wealth (Klasen & Lahoti, 2016). However, wealth ownership can be an ideal indicator of the economic well-being of individuals within a household. For women in particular, wealth ownership is not only a reflection of women’s wealth holdings within the household, but also of their bargaining power (Espinoza-Delgado & Klasen, 2018). Bargaining power enhances women's ability to make decisions within the household, such as controlling income and expenditure, schooling and making health decisions for themselves and their children (Allendorf, 2007; Doss, 2006b; Katz et al., 1963; Swaminathan et al., 2012). Also an increase in bargaining power reduces their vulnerability to violence (Agarwal, 1997; Bhattacharyya et al., 2011; Friedemann-Sanchez, 2006; Panda & Agarwal, 2005), which in turn affects their level of economic well-being. Here too, the importance of individual capabilities, as highlighted in the understanding of the concept of well-being discussed in section 2.2, is reflected. Therefore, in this analysis, ownership of wealth is used as the first indicator of women aged 60 and over's economic well-being.

2.3.3.1.2 Living standards

Housing conditions (e.g. availability of drinking water, toilets, electricity, cooking fuel, etc.) and household assets are often used in studies to indicate living standards (Deng et al., 2019; Peng, 2019; Xu et al., 2019). However, these indicators usually measure the situation of individuals within the household from a household-level perspective. This is due to the fact that information on individual use of resources within the household is often missing in most questionnaire collections (Klasen & Lahoti, 2016). In addition, there is a lot of overlap between this measure and the indicator of wealth, as household assets are included in the indicator of wealth. Wealth is also reflected, to some extent, in a person's housing conditions, and an increase in housing conditions and the number of properties accelerates the accumulation of wealth (Wang et al., 2020). Therefore, in order to reduce the
weighting bias caused by the duplication of indicators, this study does not include the indicator of living standards in the economic dimension.

2.3.3.1.3 Consumption

Some scholars have attempted to separate the actual economic well-being of women aged 60 and over from the household by using a consumption index to consider the impact of the household on the individual and to provide a more accurate estimate of women aged 60 and over's economic well-being. Researchers have suggested that consumption is a more accurate measure of well-being than income because consumption of goods, services and other inputs (e.g. time) ultimately meets a household's needs and wants (Brewer & O’Dea, 2012; OECD, 2013). Evidence from a range of studies suggests that households with low levels of resources generally tend to under-report their income, while expenditure reporting for this group is relatively accurate (Brewer & O’Dea, 2012; Meyer & Sullivan, 2011). Theoretically, households could adjust their consumption by using their savings or wealth, which means that income could also be more volatile. This finding led to Friedman’s permanent income hypothesis, in which consumers make decisions based on long-term income expectations rather than current income (Bewley, 1976).

Methods that use consumption to estimate the economic well-being of women aged 60 and over typically follow a collective household model and assume that the distribution of resources within the household follows the Pareto coefficient. The economic well-being of women aged 60 and over is estimated by calculating the share of total consumption of different types of members (e.g. women aged 60 and over), total household expenditure and the resource bargaining power of each household member (Brown et al., 2018; Browning et al., 2013; Calvi, 2019).

However, using consumption to measure women aged 60 and over's economic well-being faces four problems: firstly, to know women aged 60 and over’s consumption and the total share of overall household expenditure, it is necessary to know how much women aged 60 and over spend on each consumption category, but it is often
difficult for researchers to obtain precise information about the consumption of individual household members. Secondly, some people may tend to consume less, yet being frugal does not equate to being in a poor financial situation (OECD, 2013). Thirdly, measuring consumption has its own problems. There is evidence that households with high levels of resources tend to under-report their expenditure compared to their income (Brewer & O’Dea, 2012; Meyer & Sullivan, 2011). Lastly, while consumption estimates used in economic analysis are based on expenditure data, consumption also includes in-kind transfers of gifts and services between households, as well as in-kind social transfers. However, these aspects of consumption are often not captured due to data collection challenges (OECD, 2013). As a result, consumption as an indicator is also not included.

### 2.3.3.2 Individual income-related indicators

Due to the insensitivity of household income-related indicators for measuring individual economic well-being, researchers have turned their attention to two indicators related to individual income: individual labour income (Joo & Grable, 2004; Kahneman & Deaton, 2010) and individual social benefits (Hu, 2019; Peng, 2019). Individual labour income reflects people’s economic mobility, which can represent a person’s potential economic capacity (Jenkins, 1991). High labour income indicates a person's ability to meet their personal needs and a high level of economic well-being (Masud et al., 2015). At the same time, labour income is a convenient proxy for policy makers who want to target specific groups, such as poor people aged 60 and over (Hermalin, 2003b). The use of labour income makes it easy to quickly identify groups of people aged 60 and over who are better off and those who are less well off. For example, Yang (2018) used the national poverty line and found that 56% of rural women were living in poverty. Liu (2018) also used the

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23 The current national poverty line is generally based on the 2011 rural poverty line: an annual per capita income of ¥2,300 (£221) (based on 2011 exchange rates: ¥1=£0.09646). The poverty line for the study year can be adjusted for price fluctuations in the study year (M. Li et al., 2019; Liu & Sun, 2018; Xu et al., 2019).
national poverty line and found that the incidence of income poverty was higher for women aged 60 and over than for men aged 60 and over. Also, an individual’s social benefits, similar as individual’s labour income, is very convenient for researchers to collect using questionnaires and for use in policy making. Therefore, individual’s social benefits are often used in research. For example, Peng (2019) found that women aged 60 and over are at a disadvantage in terms of social benefits, with the majority of women aged 60 and over not having a pension or health insurance.

While these two indicators can be used to easily identify poor groups for policy purposes, the use of these two indicators only reflects the income of individuals and does not reflect their true level of economic well-being. Firstly, labour income or social benefits is not a stable measure of economic well-being as individuals may use their savings or spend their wealth when they do not have these incomes (Fah, 2010; O’Donnell, 2007). Another reason is that, as mentioned above, although researchers have found that the distribution of resources within households is not always equally distributed, the impact of households on individual economic well-being cannot be ignored. For example, in many East Asian countries, it is common for children to live with their parents throughout their lives, so their level of economic well-being is closely related to that of the family as a whole (Fan et al., 2018; Lei et al., 2015). In this case, it is difficult to distinguish how much individual economic well-being is affected by the overall level of household economic well-being. In summary, when selecting individual income-related indicators, we need to take into account both the household's impact on individual economic well-being and the individual's use of resources within the household. Therefore, this study introduces a new indicator that can take both into account - informal work.

The International Labour Organisation (ILO) defines informal employment (also known in other countries as non-standard, atypical, flexible, alternative, irregular and precarious employment) as workers who lack a formal labour contract, have
little or no social security benefits and are generally not protected by labour laws (Park, Wu, et al., 2012b). In this thesis, participation in informal work is used as one of the indicators of women aged 60 and over's economic well-being for three reasons: first, while informal work provides temporary employment opportunities and basic income by creating jobs for those who cannot find work in the formal sector (Jiang & Dai, 2019), the lack of protection of workers' rights (such as formal contracts and paid leave), these jobs are characterised by low and unstable earnings (Chou, 2010). In this case, it reflects the situation of individual labour income. Second, informal work is also associated with low economic well-being. While some scholars argue that people aged 60 and over may continue to work for non-economic reasons, such as the desire to continue working and maintain social ties (Sewdas et al., 2017). However, researchers found that in China, economic factors were the main factor influencing people aged 60 and over's decision to continue working beyond pension age, while those with insufficient pensions were more likely to continue working beyond pension age (Yu & Schömann, 2015b). As discussed in section 1.2.5, many women aged 60 and over continue to work after pension age, mainly in informal work, because of a lack of adequate pensions and the skills required for formal work. A third reason is that engaging in informal work can also reflect the impact of household economic well-being on individuals. Specifically, individuals may work informally because of economic factors, such as the need for income and benefits to support themselves, but this may also be a reflection of the low economic level of their households or the fact that they do not receive sufficient financial support from their households. The lack of financial support from the family may be related to their lack of bargaining power within the family. In summary, participation in informal work can be used as a second indicator of women aged 60 and over's economic well-being.

**2.3.3.3 Individual subjective assessment indicators**

A third indicator of women aged 60 and over's economic well-being is subjective economic well-being which is a subjective measurement of economic well-being.
Scholars have advocated this indicator mainly because it is easier to obtain from respondents who are reluctant to provide objective information on their income (Finlayson, 2002). However, previous research has shown that objective economic well-being, such as income, is not linear or directly related to subjective economic well-being (Hsieh, 2004; Litwin & Sapir, 2009; Stoller & Stoller, 2003). People aged 60 and over are more likely to give more positive subjective evaluations of economic well-being than younger groups, and a large number of poor people aged 60 and over are relatively satisfied with their current economic well-being (Airio & Nurminen, 2016; Palomäki, 2019). This phenomenon is known as the satisfaction paradox (Ginn, 2008; Hansen et al., 2008; Hsieh, 2004; Litwin & Sapir, 2009; Stoller & Stoller, 2003).

There are three main reasons for this phenomenon. First, different reference groups are used for objective and subjective measures of economic well-being (Airio & Nurminen, 2016). Specifically, the most used reference group in objective economic well-being measures is the median income group, whereas in subjective economic well-being measures, the target individuals tend to choose those around them as the comparison group. As individuals will live in social environments with different economic levels, the overall economic well-being of the median income group may not be the same as the economic well-being of those around the target of this study. Secondly, people aged 60 and over may adjust their expenses to fit their current income level (Dominy & Kempson, 2006). Third, people aged 60 and over are less likely to spend money on childcare than their younger counterparts, who may own property and other untaxed income (Litwin & Sapir, 2009; Stoller & Stoller, 2003). Thus, inconsistencies between subjective and objective measures of economic well-being may lead to bias in measurement. However, a more comprehensive understanding of women aged 60 and over's economic well-being is possible using subjective economic well-being, which allows for a comprehensive assessment of individual, household well-being and the outcome of the interaction between
individual and household well-being (Morales Martínez & Gori Maia, 2018). In other words, like the indicator of engagement in informal work mentioned above, it can capture individual well-being under the influence of household well-being and can see whether women aged 60 and over's economic well-being levels are lower than those of their household members. Overall, it provides researchers with a more realistic picture of individual economic well-being (Li et al., 2011). Therefore, this indicator serves as a third indicator representing the economic well-being dimension of women aged 60 and over in China.

In summary, for the economic well-being, I have used wealth ownership, informal work and subjective economic well-being to reflect this dimension. Whereas wealth ownership is a measure of women's possession of resources in the household and only reflects individual economic well-being, informal work and subjective economic well-being are two indicators that reflect both individual and household economic well-being. As these indicators reflect the individual economic well-being of women aged 60 and over under the influence of the household, as well as subjective and objective measures, they provide a more comprehensive picture of women aged 60 and over's well-being in this economic dimension.

2.3.4 A framework for measuring the well-being of women aged 60 and over in China

This multidimensional well-being measurement framework for women aged 60 and over in China views the well-being of women aged 60 and over as a multidimensional concept. It can be broken down into a series of well-being dimensions, each with specific (observable) indicators. With the identification of dimensions, the identification of indicators for each dimension and the construction of composite indices at different levels, the framework for measuring the well-being of women aged 60 and over in China is finally constructed, as shown in Table 2-2.
This measurement framework focuses on the core components of women aged 60 and over’s well-being - economic, physical and mental well-being - and it can reflect the level of well-being of Chinese women aged 60 and over as a whole while also observing their well-being in each dimension, facilitating a deeper understanding of their well-being in the study. Secondly, the framework is based on the individual perspectives of women aged 60 and over, and this individual perspective measure provides a more realistic picture of women aged 60 and over's well-being, especially those who live with their household members. Thirdly, the process regarding the construction process of the framework is discussed in detail, which includes the principles, dimensions and indicators that must be considered in the construction of the framework. This can be used as a guide for future researchers working on this topic. Finally, by using this framework, we can gain some insight into the situation of women aged 60 and over in China and provide a wealth of experience on topics.
related to the well-being of women aged 60 and over.

However, we also need to be aware of some of the shortcomings of this framework. Firstly, it does not perfectly cover all the characteristics of women aged 60 and over's well-being in China. It only represents three core dimensions (physical, economic and mental well-being) of women aged 60 and over's well-being, as it is based on a straightforward understanding of the definition of well-being. Therefore, in practice, it cannot be used to measure the characteristics of other dimensions that influence well-being, such as social participation and personal capability/autonomy. A measurement framework that includes dimensions of well-being impact should build on a broader understanding of well-being. Secondly, the indicators used for each dimension are not perfect representations of the dimension - they only represent the main characteristics of the dimension. Furthermore, the framework is based on the social context of China and was constructed for women aged 60 and over, so it cannot be used to measure the well-being of other groups, such as citizens of different countries, age groups and genders. However, this thesis' approach to constructing the well-being of women aged 60 and over in China can be used as a guide.

2.4 Summary

This chapter has developed a discussion around how to define and measure the well-being of women aged 60 and over in China. It began by presenting a framework for the well-being of women aged 60 and over in China, from which it attempted to capture, analyse, discuss and compare the complexity of well-being of women aged 60 and over in China for the purpose of understanding and measuring it. This framework, which is largely based on Sen's capability approach, brings together: firstly, an understanding of the subjective as well as the objective dimensions of well-being; and secondly, a full discussion of the connections between these dimensions and how they influence the constitution of the concept of well-being for
women aged 60 and over in China, taking into account individual characteristics and the fact that the individual is embedded in a social context. This integrated approach attempts to bring clarity to the concept of well-being of women aged 60 and over in China. Secondly, this chapter constructs frameworks for measuring the well-being of women aged 60 and over in China by reviewing researchers' approaches to frameworks for measuring the well-being of people aged 60 and over, based on a conceptual understanding of the well-being of women aged 60 and over in China. Although these frameworks have some limitations, such as the fact that they are specific to a particular group of older Chinese women and are not universally applicable, they can still provide some empirical assistance to future researchers undertaking similar work. The thesis will now move on to the application of the framework and the first question is what data to use, which will be explored in the following chapter.
Chapter 3 Methods and selection of data

3.1 Introduction

In the previous chapter, an exploration was developed around the first research question of this thesis: What is the well-being of women aged 60 and over in China, and how is it measured? A conceptual framework and measurement framework for the well-being of women aged 60 and over in China was constructed by conceptualising well-being. Having answered the first research question, the focus of the thesis comes to the second research question: How do living arrangements affect the well-being of women aged 60 and over in China? Clarifying the choice of research methods and data to be used in the study is a key consideration before moving to the formal analysis chapter. Therefore, the chapter begins with the choice of research method in section 3.2, followed by a detailed description of the data used in the study in section 3.3, including the reasons for its selection and the strengths and weaknesses of the data. Ethical considerations are then mentioned in section 3.4. As this study focuses on women aged 60 and over, the issue of subsampling the data is highlighted in section 3.5. This is followed by a summary of the chapter in section 3.6.

3.2 Quantitative research

To address the research question of how living arrangements affect the well-being of women aged 60 and over in China, this thesis adopts a quantitative approach. The choice of research strategy, whether quantitative or qualitative, depends on the ontological and epistemological foundation of the research (Bryman, 2016). Ontologically, the current research is based on the shallow realist assumption, which assumes that phenomena can be observed and science can discover their patterns, or sequences (Blaikie, 2010). The epistemological position of the current study is rationalism, according to which, by examining the structure of a human being’s thoughts, we can form knowledge, and the criteria for judging knowledge is logic and
mathematics (Blaikie, 2010). The current research focuses on the relationship between the well-being of Chinese women aged 60 and over and their living arrangements. All these phenomena and relationships are considered to be external and objective realities that can be directly measured using quantitative methods. Most important, the current study focuses more on this relationship than on understanding the behaviour of individual women aged 60 and over. Therefore, quantitative methods are appropriate to address the research questions in this study.

3.2.1 Secondary data analysis of panel data

The research method in the current project is secondary analysis of panel data. This is because the aim of this project is to understand the relationship between living arrangements and the well-being of women aged 60 and over in China, including the impact of changes in living arrangements on their well-being. Panel data, as one type of longitudinal data, offer the advantage of ‘analysing the duration of social phenomena’ (Ruspini, 2002, p. 24). When considering time and costs, secondary data are more practical for a thesis project than primary data, especially because they allow longitudinal research to be conducted on large-scale data. Additionally, to meet the requirement of reliability and validity for data collection, a large sample size needs to be collected according to the large and varied population of China. It will be impossible for me to finish the data collection during my PhD. Therefore, in this project, secondary data will be used for analysis.

Although secondary data analysis of panel data is well suited to my project, there are still some issues I need to consider before starting my analysis. One issue is that different topics or studies have been explored or conducted using the data that you use (Blaikie, 2010). However, this does not affect my research. There are indeed numerous studies using the data that I use in my project, but most of them are in the health or psychology field. They rarely focus on well-being. The other issue is that
when using panel data, validity may be at risk (Bryman, 2016). This is because, over time, the sample size may vary because of respondents temporarily or permanently joining or leaving the survey (Haughton & Khandker, 2009). This will make the panel data unrepresentative over time and cause potential attribution bias during data analysis (Haughton & Khandker, 2009). However, there are no perfect data. With the rapid development of social science, many ways have emerged to deal with attribution bias, such as imputation, weighting, or statistical controls for bias variables. Besides, when choosing data, my focus is representativeness. In later chapters, my sources, sampling strategy, and data collection method will be explained in detail to meet the requirements of validity and reliability in research design.

3.3 The choice of data

The data source used in the analysis is the China Health and Retirement Longitudinal Study (CHARLS). In the following section, I will explain the reasons for choosing CHARLS data by showing the design of the data (section 3.3.1), the attrition, the non-response (section 3.3.2) and survey weights (section 3.3.3) in the data, and the advantages and disadvantages of the data (section 3.3.4).

3.3.1 CHARLS study design

CHARLS has joined a family of worldwide ageing studies24; its data collection began in 2008 and is still ongoing. In 2008 and 2009 data were collected as part of pilot studies. Data on income, consumption, and public and private transfers of older people in China were collected during these two years, mainly in Gansu and Zhejiang provinces (Park, Shen, et al., 2012). These two pilot studies are not used in the analysis of this thesis, as it focuses on a sample that is not representative of the country as a whole. Therefore, this thesis primarily uses data from CHARLS 2011

24 This includes the England Longitudinal Study of Ageing, the Health and Retirement Study in the United States, and the Survey of Health, Ageing and Retirement in Europe, etc.
The geographic breakdowns in China comprise provinces, cities, counties, townships (or communes) and villages. These geographic breakdowns are in descending order according to the total population and area of the region. There are currently 34 provinces, 333 cities, 2,847 counties/districts and 38,774 villages/urban communities (The Central People’s Government of the People’s Republic of China, 2013). To represent the whole country, CHARLS uses multistage probability sampling (Y. Zhao et al., 2014). Detailed information about the sampling is provided in two official documents, *Cohort Profile: The China Health and Retirement Longitudinal Study (CHARLS)* and *China Health and Retirement Longitudinal Study – 2011–2012 National Baseline Users’ Guide*. The multistage probability sampling approach has four stages, from the county to the individual level. It collected information on the social, economic and health information of individuals aged 45 years and older and their household members in 28 provinces, 150 counties/districts and 450 villages/urban communities (see Figure 3-1). Finally, 17,708 individuals and 10,257 households were successfully interviewed. These respondents formed the CHARLS baseline (2011–2012) (Zhao et al., 2013). In this baseline, 52.1% were female, 40% were aged 60 years and older, and 77.9% were in rural areas. A detailed table showing the ages and sex of the respondents is in *Appendix A3-1*.

It is important to note that, while this study focuses on a sample that is representative of the country as a whole, as CHARLS only includes 28 provinces, the results of this study are only representative of those 28 provinces. The map of distributions of the counties and districts sampled in CHARLS is provided in Figure 3-

---

25 Excluding people in nursing homes.
26 The excluded provinces were Tibet, Ningxia, Hainan, Hong Kong, Macao, and Taiwan.
27 Other data available at the time, such as the Chinese Longitudinal Healthy Longevity Survey (CLHLS), also did not include all 34 provinces of the country. CHARLS data have advantages that other data do not (see discussion in section 1.4.1), so CHARLS data were used in this study.
CHARLS data are collected using face-to-face computer-assisted personal interviews (CAPI) every two years to guarantee data quality and minimise the chances of on-the-spot errors occurring (Zhao et al., 2013). This approach is widely believed to be better than the paper questionnaire approach (De Vaus, 2001). In the CHARLS baseline survey, 17,708 individuals were interviewed using the CAPI approach. Among them, 10,069 were the main respondents, who were aged 45 and over. The other 7,639 were the spouses of the main respondents (Zhao et al., 2014). At the time of writing, three waves of this longitudinal study (2011, 2013, 2015) have been released to the public. Therefore, the research in this thesis is based on data from these three waves, and the data used in the analysis were all collected through CAPI.
In CHARLS, if the respondents are too old to answer the questionnaires themselves or are working and cannot be interviewed, proxy respondents are used (Y. Zhao et al., 2013). The proxy response rate was 8.7%, whereas, in the follow-up studies, it decreased because the main respondents were interviewed at their current locations (Y. Zhao et al., 2013). Although proxy respondents can increase response rates, the different memories of the main and proxy respondents could lead to confounding answers to some questions and cause measurement errors (Lavrakas, 2008). Therefore, I excluded samples that used proxy respondents from the analysis.

A large number of scholars have already conducted similar studies using CHARLS data (Lei et al., 2012b; Nie, 2017; Ning et al., 2016; Park, Shen, et al., 2012; Shen, 2017), and these studies have demonstrated the validity and reliability of the data. While some variables (specific income) have many missing values, there are methods for dealing with these missing values without destroying the representativeness of the sample (Shen, 2017). All data collected by CHARLS are held at the China Centre for Economic Research (CCER), and data can be accessed through its official website http://charls.pku.edu.cn/index/en.html.

3.3.2 Attrition and non-response

In panel data, non-response problems need to be considered carefully before conducting data analysis. These non-responses could lead to bias in the sample and a loss of representativeness (De Vaus, 2001). Table 3-1 lists the details of the three waves’ attrition rates in CHARLS. There are nearly 11% respondents ‘missing’ from wave 2, and in wave 3, this figure rises to 18%.
Table 3-1 CHARLS attrition rates

<table>
<thead>
<tr>
<th>Wave</th>
<th>No. individuals achieved</th>
<th>Response rate</th>
<th>No. follow-up individuals in wave1</th>
<th>As % of wave1 achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave 1</td>
<td>17,708</td>
<td>80.50%</td>
<td>17,708</td>
<td>100%</td>
</tr>
<tr>
<td>Wave 2</td>
<td>18,604</td>
<td>84.77%</td>
<td>15,183</td>
<td>85.74%</td>
</tr>
<tr>
<td>Wave 3</td>
<td>21,091</td>
<td>83.28%</td>
<td>14,574</td>
<td>82.30%</td>
</tr>
</tbody>
</table>

*Note: Denominator is wave 1 data*

*Source: Author’s own calculation by using waves 1,2,3 of CHARLS data*

There are several ways to deal with these non-responses, but an effective way is to uncover their patterns. De Vaus (2001) in his book *Research Design in Social Research* pointed out that we can understand the types of non-responses by using some individuals’ or families’ characteristics to divide them into different groups. Then, based on their patterns, we can deal with the non-responses (De Vaus, 2001). **Table 3-1** lists the number and percentages of these non-responses by using characteristics such as age and educational level.

As **Table 3-2** shows, people who are older or with a lower level of education or income are more likely to choose not to keep participating in the survey. The extent of this bias increases with each subsequent wave, and the cumulative effect of the biased non-responses results in the need for the remaining sample to be more substantially adjusted in the third wave to resemble the population from which it was drawn. This is a caveat for any longitudinal survey.
Table 3-2 Survey non-response for CHARLS wave 2 and 3 by non-responses’ characteristics

<table>
<thead>
<tr>
<th></th>
<th>Proportion of sample not productive at wave 2</th>
<th>Proportion of sample not productive at wave 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Total non-response</td>
<td>2,525</td>
<td>14.26</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Younger than 45</td>
<td>62</td>
<td>2.44</td>
</tr>
<tr>
<td>45-60</td>
<td>1,427</td>
<td>56.25</td>
</tr>
<tr>
<td>Over 60</td>
<td>1,022</td>
<td>40.28</td>
</tr>
<tr>
<td>Missing</td>
<td>14</td>
<td>0.56</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1,274</td>
<td>50.22</td>
</tr>
<tr>
<td>Female</td>
<td>1,250</td>
<td>49.27</td>
</tr>
<tr>
<td>Missing</td>
<td>28</td>
<td>1.11</td>
</tr>
<tr>
<td>Highest level of education attained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal education</td>
<td>1,024</td>
<td>40.36</td>
</tr>
<tr>
<td>Primary school</td>
<td>487</td>
<td>19</td>
</tr>
<tr>
<td>Middle school</td>
<td>546</td>
<td>22</td>
</tr>
<tr>
<td>High school</td>
<td>248</td>
<td>9.78</td>
</tr>
<tr>
<td>Beyond high school</td>
<td>199</td>
<td>7.84</td>
</tr>
<tr>
<td>Missing</td>
<td>21</td>
<td>0.01</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>1,791</td>
<td>71.02</td>
</tr>
<tr>
<td>Cohabiting</td>
<td>296</td>
<td>11.74</td>
</tr>
<tr>
<td>Separated</td>
<td>13</td>
<td>0.52</td>
</tr>
<tr>
<td>Divorced</td>
<td>34</td>
<td>1.35</td>
</tr>
<tr>
<td>Widowed</td>
<td>353</td>
<td>14.00</td>
</tr>
<tr>
<td>Never married</td>
<td>28</td>
<td>1.11</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td>0.28</td>
</tr>
<tr>
<td>Household income (quintiles)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottom Quintile</td>
<td>440</td>
<td>17.45</td>
</tr>
<tr>
<td>Second Lowest Quintile</td>
<td>406</td>
<td>16.10</td>
</tr>
<tr>
<td>Middle Quintile</td>
<td>362</td>
<td>14.35</td>
</tr>
<tr>
<td>Second Highest Quintile</td>
<td>343</td>
<td>13.60</td>
</tr>
<tr>
<td>Top Quintile</td>
<td>290</td>
<td>11.50</td>
</tr>
<tr>
<td>Missing</td>
<td>681</td>
<td>27.00</td>
</tr>
</tbody>
</table>

Source: Author’s own calculation by using waves 1,2,3 of CHARLS data

The inherent complexity of the survey’s sampling design and the challenges of
cumulative attrition over time, combined with survey non-responses and non-responses to questions in the survey, mean that analysis and interpretation of CHARLS data can be challenging. The survey weights provided by the CHARLS data are essential if the population they represent is to be analysed. In the next part, I elaborate on the weights provided by CHARLS.

3.3.3 Survey weights

In CHARLS, there are several different types of weights at different levels (see Table 3-3). There are two levels: individual level and household level. For each level, non-response adjustments are applied. Additionally, there are two biomarker weights: one with household non-response adjustments and the other with both household non-response adjustments and individual non-response adjustments (Chien et al., 2017). In the follow-up survey (2013), CHARLS also provides a set of weights for the longitudinal sample. These longitudinal weights are based on the baseline cross-sectional sample weights with non-response adjustments at the individual and household level (CCER, Institute of Social Science Survey, and Peking University, 2015). Table 3-3 lists the details of these weights. A tick means that CHARLS provides this weight, whereas a cross means that CHARLS does not provide this weight.

Table 3-3 Survey weights for CHARLS wave 1, 2 and 3

<table>
<thead>
<tr>
<th>Weights</th>
<th>Wave 1</th>
<th>Wave 2</th>
<th>Wave 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household Weight without Non-response Adjustment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Household Weight with Non-response Adjustment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Individual Weight without Non-response Adjustment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Individual Weight with Household Non-response Adjustment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Individual Weight with Household and Individual Non-response Adjustment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Biomarker Weight with Household Non-response Adjustment</td>
<td>✓</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Biomarker Weight with Household and Individual Non-response Adjustment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Household Longitudinal Weight</td>
<td>x</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>Individual Longitudinal Weight</td>
<td>x</td>
<td>✓</td>
<td>x</td>
</tr>
</tbody>
</table>
Note that in CHARLS, only wave 2 longitudinal weights, which are non-response adjustment weights, are officially provided. It is recommended that users construct their own longitudinal weights based on suitable sample attritions (CCER, Institute of Social Science Survey, and Peking University, 2017). This way, when using data from three waves, users can utilise their own longitudinal weights as well.

Because I used three waves of CHARLS data in my analysis, I needed to construct my own longitudinal weights. In doing so, I first referred to the CHARLS wave 2 construction method. The longitudinal weights in CHARLS wave 2 are based on the baseline weight with non-response adjustment. I used the same method in my construction of the longitudinal weights. Further, the reverse probability weighting coefficients are derived from a logit regression of whether the respondent participated in the second wave of the baseline survey. Death is officially considered as a response by CHARLS when constructing the longitudinal weights. Following this principle, I also treat death as a response when constructing the weights for the three waves while using a logit regression of the full sample on whether or not the respondent participated in wave 2 and wave 3. Because the longitudinal weights are obtained using the baseline weights multiplied by the inverse probability weighting coefficients (Andreß et al., 2013), I constructed my longitudinal weights for the three waves by multiplying them with the longitudinal weights for CHARLS wave 2 after obtaining the inverse probability weighting coefficients of wave 3.

Although weighting can correct for attrition and non-response bias to some extent, making the sample more truly reflective of the overall population, one still needs to be aware that weighting could affect the precision of estimates and adjusted standard errors (Andreß et al., 2013). Additionally, weighting does not capture the behaviour and attitudes of individuals and households who did not participate in the
survey, so even when weights are applied, we do not know what the situation of these individuals and households is. The sensitivity of the weights is checked in the subsequent chapters 5, 6 and 7.

3.3.4 Strengths and weakness of the CHARLS data

Next, I illustrate the advantages of CHARLS data by comparing them with other data. Then, I discuss the limitations of CHARLS data.

3.3.4.1 Advantages of CHARLS data

Current national surveys on older people in China include the Chinese Longitudinal Healthy Longevity Survey (CLHLS), China Family Panel Studies (CFPS), and China Longitudinal Ageing Social Survey (CLASS). CHARLS has some advantages over these in studies of the relationship between the well-being and living arrangements of women aged 60 and over in China.

CLHLS data are more mature compared to CHARLS data. The survey started in 1988; there are seven waves of data as of 2014. However, these data focus more on the nutritional and health aspects of people aged 65 and over and are limited in their explication of the economic dimensions of these people, such as personal and household assets and income. CHARLS data are more detailed in this regard. Economic well-being, and in particular individual economic well-being, is an essential dimension in measuring the well-being of women aged 60 and over (see section 2.3.3 for a discussion of economic well-being). Therefore, the use of CHARLS data is more appropriate in the current study. Further, this data sample is drawn from a much smaller number of provinces (22) compared to the CHARLS sample, which is drawn from 28 provinces across the country. Therefore, the CHARLS sample is representative of a wider range of older people in China.

CFPS is almost contemporary with CHARLS. It was started in 2010, and four waves of data have been published so far. These data are not entirely specific to older people.
The sample covers all age groups in the country, so subsampling is required to use this survey in the analysis of my thesis topic. Peng (2019) used these data in her study to analyse poverty among people aged 60 and over. The total sample size of women aged 60 and over was only 879 in this study. Because there is a direct link between the size of the sample and the accuracy of inferred estimates, generally, the larger the sample size, the smaller the error in the representativeness of its statistical estimates given the overall population (Mehmetoglu & Jakobsen, 2016). CHARLS has a larger sample size for women aged 60 and over compared to CFPS, and therefore it has an advantage in estimation.

CLASS is a large national, continuous social survey project specific to people aged 45 and over that focuses mainly on investigating their social and economic background. However, these data are currently only published for one year, 2014, and are therefore not suitable for longitudinal analysis of this topic.

3.3.4.2 Limitations of the CHARLS Data

Although in the previous discussion, I pointed out the advantages of CHARLS data over other data and the reasons for its suitability for the current study, CHARLS data are not perfect. There are two main problems with its application herein. Firstly, it does not have a direct measure of individual social cohesion. Also, in the CHARLS Wave 3 data there is no measure of individual living arrangement preferences. In section 1.3 it is addressed that these two variables may affect the prediction of living arrangements on the well-being of women aged 60 and over and are therefore to be added to the model as control variables. However, the absence of measures of these two variables in the CHARLS data means that the impact of these two variables is not considered in this study when considering the relationship between living arrangements and the well-being of women aged 60 and over. Second, the subjective measure of the economic dimension of well-being was not consistently measured in the following two years in CHARLS. Therefore, it was not possible to use the subjective economic measure as an indicator in the follow-up study. Although a
cross-sectional analysis of the subjective measure of the economic dimension of well-being was conducted in the analysis, it was not possible to see the impact of changes in living arrangements on it.

3.4 Ethical considerations: confidentiality in the CHARLS survey

When considering research ethics, one typically thinks about a transaction between a researcher and a participant, for whom the researcher must fulfil certain duties in return for research participation. For example, the researcher should provide the participant with the right of informed consent. This consent should be free from coercion. Researchers should also minimise any risk of harm. Participants’ privacy and confidentiality should also be protected. However, in quantitative research, there are no participants who are being directly interviewed by the researcher analysing the data. However, this does not mean that ethical issues do not need to be considered. In quantitative research, the researcher conveys information to the general public primarily by presenting the results of the study. Thus, how to ensure that the conclusions presented to the public are real based on the analysis becomes an issue (Panter & Sterba, 2011). Reporting data that only satisfy researchers or research sponsors or, even worse, fabricating results is referred to as lying with statistics (Rosnow & Rosenthal, 2013). In the current research, unbiased communication of the findings and conclusions will be carried out, and a gentler way to report the results will be considered. On completion of the current research, a copy of the thesis will be given to the Chinese government (this is a precondition for using the CHARLS data). It is hoped that the results will shed light on issues such as inadequate social welfare.

3.5 Subsampling the data

Before starting the analysis, it is important to clarify its unit. The unit of analysis for this thesis is women aged 60 and over, therefore, this section first focuses on sample
slection (section 3.5.1). Then, the problems that the reduced sample may encounter in estimating the overall population will be highlighted (section 3.5.2).

3.5.1 The process of sub-sampling

The CHARLS baseline data focused on people aged 45 and over, with a total sample size of 17,708. Because the well-being of women aged 60 and over was the unit of analysis in this thesis, a sub-sampling approach was used. The process of sub-sampling is detailed in Figure 3-2. The first step of the sub-sampling was to pick out those aged 60 and over. Next, 10,229 observations were removed, and 7638 people aged 60 and over were retained in the sample. The second sub-sampling step was aimed at the group of women aged 60 and over. Therefore, I retained only women aged 60 and over in the final analysis sample. This step left 3,719 women, of whom 2,183 were rural women aged 60 and over and 1,536 were urban women aged 60 and over.
3.5.2 Challenge of population estimates

The sample size requires special attention when estimating the target population from the sample. Because China is a country with a population of over 1.3 billion, there are more than 90 million women who are aged 60 and over in this population.
(National Bureau of Statistic, 2011). Are the 3,719 women aged 60 and over used in the analysis in this thesis representative of women aged 60 and over across China? First, based on the discussion in the previous paragraph, it can be stated that the CHARLS sampling methodology is quite reasonable and allows for good control of sample error. By comparing the sample distribution of the population aged 45 and over in the CHARLS 2011 baseline data with the sample distribution of the population aged 45 and over in the national census data published by the National Bureau of Statistic (NBS) in 2011 (see Table 3-4), we can see that the two are quite similar. For example, the difference between CHARLS and NBS data for women aged 65–69 as a proportion of people aged 65-69 is only 0.1%.

Table 3-4 Sample distribution of the population aged 45+ in CHARLS 2011 baseline data vs. distribution of the population aged 45+ in the national census data published by the National Statistics Office in 2011 (%)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Gender</th>
<th>2010 Census</th>
<th>Residence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>45-49</td>
<td>22</td>
<td>9.2</td>
<td>11.9</td>
</tr>
<tr>
<td>50-54</td>
<td>15.3</td>
<td>7.4</td>
<td>7.9</td>
</tr>
<tr>
<td>55-59</td>
<td>20.1</td>
<td>9.8</td>
<td>10.3</td>
</tr>
<tr>
<td>60-64</td>
<td>15.6</td>
<td>7.8</td>
<td>7.8</td>
</tr>
<tr>
<td>65-69</td>
<td>10</td>
<td>5.2</td>
<td>4.8</td>
</tr>
<tr>
<td>70-74</td>
<td>8</td>
<td>4.3</td>
<td>3.7</td>
</tr>
<tr>
<td>75-79</td>
<td>5</td>
<td>2.4</td>
<td>2.6</td>
</tr>
<tr>
<td>80+</td>
<td>15.3</td>
<td>2.4</td>
<td>2.9</td>
</tr>
<tr>
<td>All</td>
<td>100</td>
<td>45.1</td>
<td>49.9</td>
</tr>
</tbody>
</table>


Second, to determine whether the sample is of sufficient size to estimate the target population, Daniel’s (1999) formula can be used:
Daniel’s (1999) sample calculation formula

\[ n = \frac{N\left(z_{\alpha/2}\right)^2 p(1-p)}{E^2(N-1)+\left(z_{\alpha/2}\right)^2 p(1-p)} \]

\( n \) is the minimum required sample size, and \( N \) is the population size. \( \left(z_{\alpha/2}\right)^2 \) is the critical value of the normal distribution at \( \frac{\alpha}{2} \) (e.g. for a confidence level of 95%, \( \alpha \) is 0.05 and the critical value is 1.96), \( E \) is the margin of error, and \( p \) is the sample proportion. Therefore, the sample size that meets the minimum requirement is 385. It has been pointed out that in inferential statistics, it is the size of the sample that matters most, not the size of the population (Mehmetoglu & Jakobsen, 2016). In other words, if the sample is large, say over a thousand, then a larger overall number can be estimated (De Vaus, 2001; Mehmetoglu & Jakobsen, 2016). In the sample I used for analysis, there were 3,719 women aged 60 and over. After dividing the sample into urban women aged 60 and over and rural women aged 60 and over, there were still over 1,000 women aged 60 and over in each sample (see Figure 3-2). Thus, my sample sizes can be used to estimate the poverty status of women over 60 years in China.

3.6 Summary

This chapter illuminates ideologically why I applied quantitative analysis to my research. Additionally, it shows how the CHARLS data were sampled, how they were collected, what the attributes and non-response rates were, and what the survey weights were. This is followed by a comparison of the sample distribution of the CHARLS data with the sample distribution of the Chinese national population to show that the CHARLS data sample is representative of the Chinese population aged 45 and over. Next, this chapter introduces the sample that I used in the study and describes the method of sub-sampling. Some clarification is provided about the challenges of sample representativeness after sub-sampling. Next, in Chapter 4 I will
focus on how the measurement framework for well-being constructed in Chapter 2 can be operationalised in CHARLS data.
Chapter 4 Operationalisation of well-being concepts

4.1 Introduction

In Chapter 2, the framework for measuring the well-being of women aged 60 years and over in China has been specified, which consists of three dimensions of physical well-being, mental well-being and economic well-being and eight indicators to represent these three dimensions. Chapter 3 then provided a detailed description of CHARLS, the data used in this thesis. The focus of this chapter will be on how this measurement framework was implemented in the CHARLS data. The chapter begins with a discussion of the operationalisation process of well-being in section 4.2. It covers three sections in terms of what variables are used to measure indicators of well-being (section 4.2.1), what approach is used to calculate the well-being scores (section 4.2.2) and how well-being scores are calculated by the selected approach (section 4.2.3). In addition, the descriptive results of well-being scores for women aged 60 years and over in China are presented in this chapter (section 4.3). The subsequent section 4.4 also discusses the three statistical methods used in the analysis of the thesis: the fixed effects model, the multiple linear regression model and the logistic regression model. And the limitations of the analytical approach used in this study are discussed in section 4.5. The software used for the analysis is also described in section 4.6. Finally, a summary of this chapter is presented in section 4.7.

4.2 Operationalisation of well-being

4.2.1 Selection of variables

4.2.1.1 Physical well-being

Physical well-being includes three indicators of chronic illness status, functional
impairment status and self-rated health status. Regarding the measurement of chronic illness status, respondents were asked in the CHARLS questionnaire about the prevalence of 14 common chronic illnesses, such as hypertension, diabetes mellitus and hyperlipidaemia (‘Have you been diagnosed with [conditions listed below, read one by one] by a doctor?’ See Appendix 4-1 for specific conditions).

When it comes to the status of functional impairment, a measure of an individual's ability to perform activities of daily living independently (Katz et al., 1963), known as basic activities of daily living (ADL), and a measure of an individual's ability to live independently in the home and community (Lawton & Brody, 1969), known as instrumental activities of daily living (IADL), are commonly used in research to measure functional impairment status (e.g., Malisauskaite et al., 2021; Smith & Connolly, 2020). In the CHARLS questionnaire, six items were asked about ADL, namely dressing, bathing, eating, getting in and out of bed, going to the toilet and controlling urination and defecation, and five about IADL, namely housework, cooking, shopping, managing money and taking medication. The options for each activity were divided into four categories: 'no difficulty', 'difficulty but still able to do it', 'difficulty and need help' and 'unable to do it'. It is worth noting that the 2013 and 2015 questionnaires asked respondents if they had difficulty making phone calls in addition to the five items mentioned above about IADLs, but this question was not included in the 2011 questionnaire. If different measures of IADLs are used in different years this may bias the results of the analysis. Therefore, to ensure the accuracy of the analysis, IADL was only measured for five items: housework, cooking, shopping, money management and taking medication.

For the self-rated health status, the CHARLS questionnaire asked respondents to use the terms ‘very good’, ‘good’, ‘fair’, ‘poor’ and ‘very poor’ to rate their health status.

4.2.1.2 Mental well-being

Mental well-being includes both indicators of depression status and perceived mental well-being. A 10-item version of the Centre for Epidemiological Studies
Depression Scale (CES-D scale) was used in the CHARLS questionnaire to understand the level of mental health of people, primarily measuring respondents' depression. Each question has four options, and each option is given a score of 0–3 in turn.

Regarding perceived mental well-being, the CHARLS questionnaire asks respondents how they would rate their lives. Respondents were asked to choose one of five options: 'completely satisfied', 'very satisfied', 'somewhat satisfied', 'not very satisfied' and 'not at all satisfied'. It is important to note that although this question in the questionnaire appears to be an assessment of one's 'life satisfaction', there is a translation problem in that it should be translated as 'perceived mental well-being'. This is because this question appears in the ‘Health and Functioning’ section of the CHARLS questionnaire, which asks about the respondent’s health, physical functioning, cognitive functioning and mental state. It focuses on the respondent's health (Zhao et al., 2013). Thus, although the question appears to be about ‘life satisfaction’, it is actually about the mental well-being of the respondent in general. Furthermore, it comes at the end of the assessment of the respondent's depression and is in fact a question that allows the respondent to make a summative assessment of his or her overall state of mental well-being. As such, it should not be seen as 'life satisfaction'.

4.2.1.3 Economic well-being

Economic well-being includes informal work status, wealth ownership status, and subjective economic well-being. The CHARLS questionnaire does not directly ask about informal work. But based on the definition of informal work as the type of work that has no formal employment contract, receives little or no social benefits and is generally not protected by labour law (Park, Wu, et al., 2012b), it is possible to construct variables from the data on the respondents' informal work status. The CHARLS questionnaire asks respondents in detail about their formal contractual

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28 In Chapter 2, ‘life satisfaction’ was discussed as an approach of understanding subjective well-being, which focuses on the cognitive component of subjective well-being.
status, income and social benefits for the job they hold. In addition, the CHARLS questionnaire asks in detail whether the respondent is in their current job as a hobby; that is, whether they are doing the job not to earn money, but to pursue their interests (e.g., maintaining social participation). As mentioned in the discussion in section 2.3.3.1, the indicator of informal work is used to capture the well-being of women aged 60 years and over in China at the individual level, at the household level and the interaction of these two levels. This is to identify situations where individual income is low, or household income is low, or household income is high but does not support these women. Therefore, work that is not for money but for interest is not classified as informal work. In addition, if a respondent is unemployed, she is also considered to be in informal work. This is because unemployment also reflects the low economic well-being of the respondent (Dong & Yang, 2006). Therefore, in the construction, if the respondent is working in a job with no formal contract and no or low social benefits, and if she is not doing it for pleasure, or if she is unemployed, she is considered to be working informally (1 = informal) and the rest is considered to be working formally (0 = otherwise).

With regard to wealth ownership status, the CHARLS questionnaire asked in detail about the financial assets (stocks, funds, cash, commercial papers and bank deposits) and properties in the household, and also about the respondent’s possession of these assets. With regard to financial assets, the questionnaire asked respondents about the percentage of assets they owned, but did not ask a similar question about properties, asking only whether they owned properties. Thus, assets ownership status was constructed as a dichotomous variable (1 = owning the asset, 0 = otherwise).

In the CHARLS 2011 questionnaire, the question used to measure people’s subjective economic well-being was ‘G003. Overall, how would you rate your own standard of
living?' This question asked respondents to rate their standard of living using ‘very high’, ‘relatively high’, ‘average’, ‘relatively poor’ and ‘poor’ as descriptors. However, this variable is only available in the 2011 baseline and no other measures were available that year to measure subjective economic well-being. Thus, the subjective economic well-being was not included in the analysis when using three years of data. However, the exclusion of subjective measures of economic well-being does not provide a complete picture of individual economic well-being, and therefore an additional chapter has been added to this thesis. It uses economic well-being, which includes both subjective and objective indicators, as the dependent variable, using one year of data from 2011 to explore the relationship between living arrangements and economic well-being (see Chapter 6).

4.2.2 Selection of methods for calculating well-being scores

Currently, there are two main approaches to calculating well-being scores that are commonly used in both English and Chinese academic literature. The first is the item-by-item approach, which uses a single dimensional inequality index (e.g., the Gini coefficient) to calculate the scores of well-being of each dimension one by one (e.g., Gao, Wang & Yang, 2018; Xu, 2019). Although this approach is simple and easy to implement, its main limitation is that it can only examine the level of each dimension in isolation and cannot measure the overall level of well-being in an integrated manner. Neither can it determine the contribution of each dimension of well-being to the overall level of well-being (Nilsson, 2010). The second approach is the aggregative approach, which integrates the dimensions to form a composite measure of well-being (e.g., Gao, 2019; Hu, 2019; Lifshitz, Nimrod & Bachner, 2019; Phan & O’Brien, 2019). This approach compensates for the shortcomings of the item-by-item approach and is therefore used in the current study. There are currently four common methods that could be used to measure a composite score of well-being as

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29 Standard of living refers to the combination of wealth, services, comfort, and material goods considered the basic conditions people need to live (Fah, 2010). This is discussed in detail in section 2.2.1.1.
well as scores on each dimension: scaling techniques, fuzzy set theory, structural
equation modelling and Alkire-Foster (A-F) counting approach (Alkire & Foster, 2007).

4.2.2.1 Scaling techniques
Scaling techniques are statistical solutions for aggregating indicators with different
units of measurement, generally at the macro level. They are often used to rank
countries and regions in comparison to each other in terms of their level of well-
being. Some examples are the Human Development Index (UNDP, 1990), the Active
Ageing Index (Zaidi et al., 2017), the UK’s Office for National Statistics well-being
(2018) and Age UK’s ‘Index of well-being in later life’ (Age UK, 2017). Scaling
techniques start by converting the variable to be used into a unitless variable ranging
between 0 and 100. This conversion is obtained by comparing the individual’s score
on each indicator with the lowest and highest scores observed for the same indicator
across all individuals in the data set (see Equation 4-1).

Equation 4-1 Unitless variable transformation formula

\[ x_{\text{index}} = \frac{x - \min(x)}{\max(x) - \min(x)} \]

Here \( x \) represents the indicators.

After obtaining the individual’s score on each indicator, the scores for each indicator
under each dimension are summed to form the individual’s score on that dimension.
Each dimension is then weighted, and the weighted scores for each dimension are
summed to obtain the final individual score for total well-being, which also
represents the level of total well-being. This approach has the advantage of
aggregating indicators with different units of measurement at the macro level and
avoiding the assignment of arbitrary weights (Chiappero-Martinetti & Roche, 2009).
However, it also has certain problems. First, it requires a maximum and a minimum
value to be used as a standardised benchmark in unitless variable conversions.

\[ \text{Equation 4-1} \]

30 In fact, structural equation modelling does not measure well-being through well-being scores, as
discussed in detail in section 4.2.2.3.
However, at a technical level, the definition of maximum and minimum target bars is still a controversial issue (Anand, 1994; Chakravarty, 2003; Chiappero-Martinetti & Roche, 2009; Kanbur, 1991; Kuklys, 2005; McGillivray & White, 1993). The use of different maximum and minimum values can affect the calculation of the results and thus make the inferences drawn from the study controversial. The representativeness of the data sample (e.g., the maximum and minimum values in the sample are not the maximum and minimum values in the population) can also affect the accuracy of the results. Further, unitless variable transformations require continuous variables, which are not the only possible units of measurement. Ordered or categorical variables are common in multidimensional analysis, particularly at the micro level. Consequently, these techniques are not fully applicable to interpersonal comparisons (Chiappero-Martinetti & Roche, 2009). Therefore, based on these two issues, the above approach was not used in the current thesis.

4.2.2.2 Fuzzy set theory
Fuzzy set theory compensates to some extent for the shortcomings of scaling techniques because it can deal with both continuous and ordinal variables and be used for micro-level analysis. In this approach, dichotomous variables take the value 0 or 1. For example, when \( j \) represents the dimension of health insurance, the subordination of the variable \( x_{ij} \) is 0 when a member of household \( i \) has health insurance, that is, \( x_{ij} = 0 \). Conversely, when the \( i \)th household member does not have health insurance, the affiliation of the variable \( x_{ij} \) is 1; that is, \( x_{ij} = 1 \). For sequential and continuous variables, a function is determined that takes values between 0 and 1, as in the following equation.

**Equation 4-2 A computational method based on fuzzy set theory**

\[
U_p = \begin{cases} 
1 & , \quad 0 < x_{ij} \leq x_{\min j} \\
\frac{x_{\max j} - x_{ij}}{x_{\max j} - x_{\min j}} & , \quad x_{\min j} < x_{ij} < x_{\max j} \\
0 & , \quad x_{ij} \geq x_{\max j}
\end{cases}
\]

In this equation, \( x_{\min j} \) and \( x_{\max j} \) represent the two limit values of the individual in the \( j \)th dimension, respectively. When the value of the indicator variable is greater than or equal to the highest domain value \( x_{\max j} \), its affiliation value is 0, that is, \( U_p \).
= 0, meaning that the individual is above the highest level of well-being on the indicator. When the value of the indicator variable is between the minimum domain value $x_{\text{min}, j}$ and the highest domain value $x_{\text{max}, j}$, it means that the indicator reflects the individual’s state of well-being, which is neither good nor bad, and reflects different levels of well-being. The lower the level of well-being, the larger the value.

This approach has the advantage of retaining the inherent complexity and ambiguity of the concept (Qizilbash, 2006), but a part of the modal set (values between 0 and 1) still needs to be compared with the maximum or minimum value between sets in the aggregation operation. This is similar to how scaling techniques are handled, so there is also the controversial issue of the definition of the maximum and minimum values that exist with scaling techniques. Therefore, this thesis does not use fuzzy set theory to calculate integrated values for the well-being of aged 60 years and over in China.

4.2.2.3 The structural equation modelling (SEM)

The structural equation modelling (SEM) allows a broader concept to be measured through a set of indicators (Kuklys, 2005). It allows the researcher to assess the overall fit of the model while conducting a factor analysis and to explicitly deal with measurement error (Chiappero-Martinetti & Roche, 2009). This model differs from the two models described above for calculating well-being scores. This model combines a measurement model and a structural model, i.e., it allows both the measurement model of well-being and the structural model of how living arrangements affect well-being to be incorporated into the diagram, making it easy to see the relationships between these variables. It is effective in estimating based on continuous variables but remains problematic in the treatment of discrete variables. As SEM requires that the observed variable should conform to a normal distribution (Werner & Schermelleh-Engel, 2009), it is possible to treat the ordinal variable as if it were a normally distributed continuous variable (Lefcheck, 2021). However, for dichotomous and categorical variables, the criterion of conforming to a normal distribution is very difficult. Thus, it is suggested that the treatment of dichotomous variables could be that by setting the value of the variable to a number,
the variable becomes a coefficient that represents the expected change, i.e., from state 0 to state 1 (Lefcheck, 2021). For category variables it is possible to create dummy variables for each level, i.e., splitting the level into separate categories, each with a state of 0 or 1. This is then treated in the same way as for dichotomous variables above (Lefcheck, 2021). However, the problem with this is that it can become very complex when dealing with a large number of categorical variables. Also, when both measurement and structural models are added to the same model it can greatly increase the complexity of the model and make model interpretation very difficult (Lefcheck, 2021; Werner & Schermelleh-Engel, 2009). From the discussion in section 4.2.1, it is clear that of the variables measuring well-being of women aged 60 years and over, only the variable measuring depressive status is a continuous variable, the rest are dichotomous, categorical and ordinal variables. And the independent variable to be included in this study, living arrangements, is also a categorical variable. Therefore, the use of structural equations in this study was too complex and, given the time constraints of a PhD study, the method was not used in this thesis.

4.2.2.4 Alkire-Foster (A-F) counting method.
Based on all the above considerations, this study introduces the A-F counting method. This calculation is not strictly a method for calculating the well-being scores, as it focuses on demonstrating poor or inferior individual well-being with parameters that relate to the extent to which individuals are deprived on different dimensions of well-being (Halleröd & Seldén, 2013; Naidoo, 2019). Therefore, this calculation actually measures the state of individual ill-being. The idea that ill-being reflects a negative state rather than well-being per se has been highlighted by a number of scholars (e.g., Headey et al., 1984; Lee & Oguzoglu, 2007; Sirgy, 2017). However, given that most of the variables used to construct well-being in this thesis are categorical variables, none of the three methods mentioned above (section 4.2.2.1, section 4.2.2.2 and section 4.2.2.3) deal well with categorical variables. I therefore had to compromise on using this method to measure well-being.

More specifically, of the common methods discussed above, only the fuzzy set
method can deal with categorical variables. In contrast, neither the scaling method nor the structural equation can deal with such variables simply and effectively. In addition, although the fuzzy set approach can deal with categorical variables, it requires a comparison of the values taken by individuals on each indicator with the maximum and minimum values obtained by the group in the sample on that indicator to obtain a score when calculating the well-being scores. The uncertainty of this method of calculation can cast doubt on the findings (see the discussion in section 4.2.2.2).

The A-F method is more feasible than fuzzy set theory where the maximum and minimum values must be determined in the sample. This is because it is not influenced by the representativeness of the sample. It does not compare the maximum and minimum values in the sample but instead delineates the thresholds based on actual conditions. Because researchers have practised and summarised most of these thresholds in real populations (e.g., Batana, 2013; Klasen & Lahoti, 2016; Callander & Schofield, 2017; Liu, 2018; Song & Zhan, 2018; Deng, Bi & Nie, 2019; Gao, 2019; Hu, 2019; Lifshitz, Nimrod & Bachner, 2019; Wang & Tao, 2019; Chan & Wong, 2020; Chen & Leu, 2020; Song, Wu & Zheng, 2020), this method yields a closer representation of the reality of individual well-beings method is closer to the reality of individual well-being.

A third benefit of using the A-F approach is that it allows for more accurate identification of deprived people (Alkire & Santos, 2011) and demonstrates deprivation across dimensions of well-being (Alkire et al., 2015; Alkire & Foster, 2007). Therefore, using this method, it is possible to visualise the deprivation of Chinese women aged 60 years and over in each dimension and in overall well-being, and thus identify those who are currently experiencing ill-being and the related problems they face. Additionally, this method of analysis makes it possible to determine the impact of living arrangements on deprivation in terms of these women’s well-being to identify the adverse effects of living arrangements.
Although there are some advantages in choosing to use the A-F count in the thesis, this is a compromise in the face of operationalisation difficulties. As a result, the well-being measured in this thesis only reflects the ill-being of Chinese women aged 60 and above, not their overall well-being. In future research, if the variables used to measure well-being are all continuous variables, other methods will need to be used to fully capture full meaning of well-being.

4.2.3 Calculating well-being deprivation scores

In section 4.2.2, it was mentioned that due to the limitations of the data it is only possible to measure deprivation of well-being in practice. Therefore, to capture what is actually measured in this thesis, well-being deprivation scores will be used where the results of the analysis are described (section 4.2.3, section 4.3, Chapter 5, Chapter 6).

4.2.3.1 Applying Alkire-Foster counting approach in CHARLS data

In this study, \( N \) denotes the number of women aged 60 years and over in China, and \( D = 3 \) denotes the three dimensions in the well-being measurement framework for women aged 60 years and over in China. For each indicator \( j \), a threshold \( z_j \) is defined as the minimum achievement required for deprivation. This threshold is referred to as the deprivation cut-off. The deprivation cut-off is collected in a \( d \)-dimensional vector \( z = (z_1, \ldots, z_d) \). Given each individual’s achievement on each indicator \( x_{ij} \), an individual is said to be deprived on an indicator \( j \) if the level of achievement of the \( i \)th individual on that indicator is below the respective deprivation cut-off \( z_j \) (that is, if \( x_{ij} < z_j \)) (see Equation 4-3). For example, if a woman aged 60 years and over is depressed on the depressive condition indicator, this woman is considered deprived on that indicator; otherwise, she is considered not deprived.

**Equation 4-3 Deprivation cut-off:**

\[
g_{ij}^0 = \begin{cases} 
1 & \text{if } x_{ij} < z_j \\
0 & \text{if } x_{ij} \geq z_j 
\end{cases}
\]
The deprivation matrix \( g^0 = [g_{ij}^0] \) representing the deprivation status of individual \( i \) in the dimension \( j \).

In this study, the deprivation thresholds for Chinese women aged 60 years and over for each of the indicators mentioned in section 4.2.1 were based on thresholds that have been commonly used in previous studies (e.g., Batana, 2013; Klasen & Lahoti, 2016; Callander & Schofield, 2017; Liu, 2018; Song & Zhan, 2018; Deng, Bi & Nie, 2019; Gao, 2019; Hu, 2019; Lifshitz, Nimrod and Bachner, 2019; Wang & Tao, 2019; Chan & Wong, 2020; Chen & Leu, 2020; Song, Wu & Zheng, 2020).

For the indicator of chronic illness status, women aged 60 years and over were considered deprived on this indicator if they had a chronic disease. For the indicator of functional impairment status, women aged 60 years and over were considered deprived if they were unable to complete either the ADLs or the IADLs independently. For the self-rated health status, women aged 60 years and over were considered deprived if they answered "poor" or "very poor".

For depression status, the scores were first summed according to the CES-D calculation to obtain a depression score of 0–30, and women aged 60 years and over were considered deprived on this indicator if their CES-D score was greater than 10 (Othieno et al., 2014). Regarding perceived mental health, women aged 60 years and over were considered deprived on this indicator if they answered 'not very satisfied' and 'not at all satisfied'.

Similarly for the indicator of informal work, women aged 60 years and over were considered deprived on this indicator if they reported that they work informally. For the wealth ownership indicator, women aged 60 years and over were considered deprived if they answered that they have no wealth ownership (that is, they have no joint financial assets and properties with household members and no separate financial assets and properties). For the self-rated standard of living indicator,
women aged 60 years and over were considered deprived if they answered ‘relatively poor’ and ‘poor’

After determining the deprivation of indicators in each dimension, the weighting of each dimension needs to be considered. Weights reflect the relative importance of each dimension or indicator in a multidimensional deprivation measure, and different setting options can affect the results of the measure. There is currently no consensus on the criteria for weight selection (Alkire & Jahan, 2018; Decancq & Lugo, 2012). In choosing weights, one can generally consider using equal weights or determine weights based on the important rows of each dimension, with higher weights indicating greater relative value.

However, there are other factors that must be taken into consideration. First, complex weighting systems can pose a challenge to interpretation (Atkinson, 2003). Second, some scholars have conducted robustness analyses of multidimensional poverty with different weights and found that the findings do not differ much under different weights (Klasen & Lahoti, 2020; Vijaya et al., 2014). As a result, scholars have widely used the equal-weights approach (e.g., Wang & Tao, 2019; Alkire, Kanagaratnam & Suppa, 2020; Chen & Leu, 2020). In this paper, too, the equal dimensional weighting approach is applied. Ultimately, the dimensions, indicators, cut-offs, and weights used to calculate well-being deprivation scores are shown in Table 4-1.
Table 4-1 Dimensions, indicators, deprivation and weights of older women’s well-being

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Indicators</th>
<th>Deprived If.</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical well-being</td>
<td>Chronic illnesses status</td>
<td>Have a chronic illness</td>
<td>1/9</td>
</tr>
<tr>
<td></td>
<td>Functional impairment status</td>
<td>Unable to complete either the ADLs or the IADLs independently</td>
<td>1/9</td>
</tr>
<tr>
<td></td>
<td>Self-reported health status</td>
<td>Health status is ‘poor’ or ‘very poor’</td>
<td>1/9</td>
</tr>
<tr>
<td>Economic well-being</td>
<td>Informal work status</td>
<td>Work informally</td>
<td>1/6</td>
</tr>
<tr>
<td></td>
<td>Wealth ownership status</td>
<td>No joint financial assets and properties with household members and no separate financial assets and properties</td>
<td>1/6</td>
</tr>
<tr>
<td>Mental well-being</td>
<td>Depression status</td>
<td>With a CES-D score greater than 10</td>
<td>1/6</td>
</tr>
<tr>
<td></td>
<td>Perceived mental well-being</td>
<td>Not very satisfied or not at all satisfied</td>
<td>1/6</td>
</tr>
</tbody>
</table>

Source: Author constructed based on three waves of CHARLS data.

After determining the deprivation of indicators in each dimension and applying equal weights to each dimension, the deprivation score for each individual is calculated using Equation 4-4:

Equation 4-4 Calculating the deprivation score

\[ c_i = \sum_{j=1}^{d} w_j g_{ij}^0 \]

\( w_j \) is used to indicate the relative importance of deprivation in each dimension. 
\( c_i \) denotes the deprivation score of person \( i \).

Thus, each person’s deprivation score is the sum of their weighted deprivations. The score increases as the number of deprivations a person experiences increases, reaching a maximum when the person is deprived in all dimensions.

4.2.3.2 Missing values and correlations of variables

Table 4-2 shows the missing values for the variables used to construct the well-being deprivation scores (three waves of data). The proportion of missing values for the
variable of perceived mental well-being amounts to 10.83%. This is because no one else was allowed to answer such questions for the respondent in the CHARLS questionnaire, and if the respondent was unable to answer, it was recorded as missing. Most of the variables used to calculating well-being deprivation scores did not have a missing value of more than 10% and the perceived mental well-being variable had a missing value of more than 10% but not more than 11%, therefore I applied casewise/listwise deletion to exclude them from the calculation of well-being deprivation scores for women aged 60 years and over. Individual weights with non-response adjustment were used when presenting well-being deprivation scores.

Table 4-2 Missing values for variables used to calculating well-being deprivation scores for aged 60 years and over

<table>
<thead>
<tr>
<th>Variable</th>
<th>Missing</th>
<th>Total</th>
<th>Percent Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic illnesses status</td>
<td>748</td>
<td>8,328</td>
<td>8.98</td>
</tr>
<tr>
<td>Functional impairment status</td>
<td>33</td>
<td>8,328</td>
<td>0.4</td>
</tr>
<tr>
<td>Self-rated health status</td>
<td>380</td>
<td>8,328</td>
<td>4.56</td>
</tr>
<tr>
<td>Informal work status</td>
<td>78</td>
<td>8,328</td>
<td>0.94</td>
</tr>
<tr>
<td>Wealth ownership status</td>
<td>138</td>
<td>8,328</td>
<td>1.66</td>
</tr>
<tr>
<td>Depression status</td>
<td>702</td>
<td>8,328</td>
<td>8.43</td>
</tr>
<tr>
<td>Perceived mental well-being</td>
<td>902</td>
<td>8,328</td>
<td>10.83</td>
</tr>
</tbody>
</table>

Source: Authors’ estimates based on data from CHARLS three waves.

Table 4-3 presents an analysis of the correlations among the variables used to construct well-being deprivation scores, and of the Spearman coefficients used. It was not possible to weight the variables when using the Spearman coefficients, so the table shows the results without weights. As Table 4-3 shows, first, there were no correlations among any of the indicators except for a few that were correlated with each other. For example, depression status was correlated with two variables: chronic illness status, self-rated health status; perceived mental well-being was correlated with three variables: chronic illness status, self-rated health status and depression status; and informal work was correlated with two variables: wealth ownership and self-rated health status. The correlations among these variables were weak; most were less than 0.2. Only the relationship between self-rated health status and other health conditions (depression status, perceived mental well-being
and chronic disease status) exceeded 0.2. But because self-rated health status is a subjective measure of physical well-being, it provides a more comprehensive measure for physical well-being. Thus, it can be argued that the indicators chosen for this measurement framework provide a more comprehensive measure of the well-being of women aged 60 years and over from different perspectives.

Table 4-3 Spearman correlation coefficients between variables (unweighted)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Chronic illnesses</th>
<th>Functional impairment</th>
<th>Self-rated health</th>
<th>Informal work</th>
<th>Assets Ownership</th>
<th>Depression Status</th>
<th>Perceived mental health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic illnesses</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional impairment</td>
<td>0.0246</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-rated health</td>
<td>0.2489*</td>
<td>0.0507</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informal work status</td>
<td>-0.0589*</td>
<td>-0.0451</td>
<td>-0.0844*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset ownership</td>
<td>-0.0014</td>
<td>-0.0127</td>
<td>0.0339</td>
<td>-0.0698*</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression status</td>
<td>0.1655*</td>
<td>0.0308</td>
<td>0.3848*</td>
<td>0.0377</td>
<td>-0.0019</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Perceived mental health</td>
<td>0.0787*</td>
<td>0.0433</td>
<td>0.2338*</td>
<td>0.0114</td>
<td>0.0215</td>
<td>0.3822*</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes: *Correlation is significant at the 0.01 level (2-tailed).

Source: Authors’ estimates based on 2011 CHALRS.

4.3 Descriptive results: Well-being of women aged 60 years and over in China

4.3.1 Deprivation of well-being

Table 4-4 shows descriptive results of deprivation scores for the overall well-being of women aged 60 years and over in China. As the table indicates, deprivation scores for the overall well-being were distributed between 0 and 1, and the trend over the three years was towards a decrease followed by an increase in the value for both urban and rural areas. This decrease and increase trend can be interpreted as a sign that the number of dimensions of deprivation in the well-being of women aged 60 years and over in China decreased in 2013 but increased in 2015. This in turn suggests that the well-being of these women is improving and then getting worse. Previous studies have found that people from disadvantaged backgrounds (e.g., low education, low income) are more likely not to take part in the next survey (Andreß et
This issue is also present in the CHARLS data (see section 3.3.2 for a detailed discussion), so it may be a problem of sample attrition. Although I used longitudinal weights when calculating this well-being deprivation scores, which went some way towards solving the problem, this is still not a perfect solution.

Table 4-4 Deprivation scores for the overall well-being of women aged 60 years and over in China (weighted)

<table>
<thead>
<tr>
<th>Deprivation scores</th>
<th>Year</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>2011</td>
<td>1,779</td>
<td>0.248</td>
<td>0.008</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td>1,518</td>
<td>0.209</td>
<td>0.007</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td>1,422</td>
<td>0.215</td>
<td>0.007</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Urban</td>
<td>2011</td>
<td>1,241</td>
<td>0.142</td>
<td>0.019</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td>954</td>
<td>0.113</td>
<td>0.009</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td>818</td>
<td>0.121</td>
<td>0.010</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Authors’ estimates based on data from CHARLS three waves.

As mentioned in the section 4.2.2.4, one of the benefits of the A-F approach is that it displays deprivation scores for each dimension of well-being. Table 4-5 reflects the deprivation of women aged 60 years and over in China on each dimension of well-being. Overall, deprivation on each dimension of well-being is different for urban and rural women aged 60 and over between 2011 and 2015. In addition, deprivation scores for women aged 60 and over in rural China increased each year for physical well-being, decreased each year for mental well-being, and increased and then decreased for economic well-being. For urban women aged 60 and over, deprivation scores for physical well-being declined and then increased, deprivation scores for mental well-being declined each year, and deprivation scores for economic well-being increased and then decreased.

These different changing trends may be related to economic differences between rural and urban areas, social benefits differences, lifestyle differences and more severe air pollution in urban than rural areas (Liu, 2016). More specifically, rural women aged 60 and over have lower health insurance benefits and do not receive timely treatment for many illnesses, while urban women aged 60 and over have
better health insurance benefits (see discussion in section 1.2.3.2). Also, the economic situation of women aged 60 and over in rural areas is less favourable than that of women aged 60 and over in urban areas (see discussion in section 1.2.2). In addition, adult children are an important source of support for women aged 60 and over in rural areas because of poor formal support systems, but the proportion of parents living with their children has been declining over the years. This change could lead to women aged 60 and over being left unattended when they need care, which can harm both their physical and mental well-being (Liu, 2018). In contrast, formal care services are more developed in urban areas than in rural areas, so women aged 60 and over in urban areas are less likely to be left unattended than in rural areas (Liu, 2018). Also, rising urban air pollution year on year may also make the health of urban populations worse than that of rural populations (Liu, 2016).

Table 4-5 Deprivation scores for dimensions of well-being for women aged 60 and over in China (weighted)

<table>
<thead>
<tr>
<th>Areas</th>
<th>Year</th>
<th>Domains</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>2011</td>
<td>Physical well-being</td>
<td>0.341</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Economic well-being</td>
<td>0.241</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mental well-being</td>
<td>0.418</td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td>Physical well-being</td>
<td>0.370</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Economic well-being</td>
<td>0.265</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mental well-being</td>
<td>0.366</td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td>Physical well-being</td>
<td>0.381</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Economic well-being</td>
<td>0.255</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mental well-being</td>
<td>0.363</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>Physical well-being</td>
<td>0.391</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Economic well-being</td>
<td>0.155</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mental well-being</td>
<td>0.454</td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td>Physical well-being</td>
<td>0.377</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Economic well-being</td>
<td>0.200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mental well-being</td>
<td>0.423</td>
</tr>
<tr>
<td>Urban</td>
<td>2015</td>
<td>Physical well-being</td>
<td>0.410</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Economic well-being</td>
<td>0.187</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mental well-being</td>
<td>0.403</td>
</tr>
</tbody>
</table>

Notes: Rural 2011(N=1,779); 2013(N=1,518); 2015(N=1,422); Urban 2011(N=1,241); 2013(N=954); 2015(N=818).

Source: Authors’ estimates based on data from CHARLS three waves.
4.3.2 Deprivation of economic well-being (with the addition of subjective well-being)

As CHARLS only has a measure of subjective economic well-being for the year 2011, Chapter 6 of this thesis provides a cross-sectional study of economic well-being of individuals with the inclusion of the subjective economic well-being indicator (see discussion in section 4.2.1.3). Table 4-6 reflects the deprivation of individuals on this dimension with the inclusion of the subjective economic well-being indicator. It is evident that even after the inclusion of the subjective economic well-being indicator, rural women aged 60 and over are still more deprived on this dimension than urban women aged 60 and over, which is consistent with the results presented in Table 4-5. Interestingly, with the inclusion of the indicator of subjective economic well-being, deprivation scores on this dimension increase by almost 0.1 for both rural and urban women aged 60 and over. This means that for both rural and urban women aged 60 and over, most of them rate their level of economic well-being ‘relatively poor’ or ‘poor’.

Table 4-6 Deprivation scores in the economic dimension (including subjective well-being) (weighted)

<table>
<thead>
<tr>
<th></th>
<th>Rural (N=1,992)</th>
<th>Urban(N=1,363)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deprivation scores</td>
<td>0.347</td>
<td>0.215</td>
</tr>
</tbody>
</table>

*Source: Authors’ estimates based on data from CHARLS wave 1.*

Looking separately at deprivation in subjective economic well-being for women aged 60 and over (see Table 4-7), 2,183 rural women aged 60 years and over and 1,536 urban women aged 60 years and over reported their subjective economic well-being in the CHARLS baseline survey. Of the urban women aged 60 years and over, 32.59% reported that they were in a deprived financial situation, while more rural women (38.88%) reported the same. Also, the proportion of rural women aged 60 years and over who responded that their financial situation was not deprived remained 51.02% lower than the proportion of urban women aged 60 years and over reporting the same. At the same time, women aged 60 years and over in both urban and rural
areas had missing values in this response, and the proportion of missing values was higher for both. Women aged 60 years and over in rural areas had a missing value of 10.10% for this question, while in urban, it was much higher at 14.86%. This may be because women aged 60 years and over in urban areas are better off than those in rural areas, and they may be more reluctant to answer money-related than rural women (Zhong et al., 2014).

Table 4-7 Distribution of subjective economic well-being among women aged 60 years and over in China: by urban and rural areas (weighted)

<table>
<thead>
<tr>
<th>Subjective economic well-being</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deprived</td>
<td>38.88</td>
<td>32.59</td>
</tr>
<tr>
<td>Not deprived</td>
<td>51.02</td>
<td>52.55</td>
</tr>
<tr>
<td>Missing</td>
<td>10.10</td>
<td>14.86</td>
</tr>
<tr>
<td>N</td>
<td>2,183</td>
<td>1,536</td>
</tr>
</tbody>
</table>

*Source: Author’s calculations using the CHARLS wave 1(2011)*

The results of the difference between subjective and objective measures of economic well-being may reflect several facts. First, as discussed in section 2.3.3.3, objective and subjective measures of economic well-being do not always result in the same outcomes. Objective and subjective measures actually reflect different aspects of economic well-being, so they should be combined to give a more intuitive picture of the dimension of economic well-being (Morales Martínez & Gori Maia, 2018). Secondly it may also reflect the fact that the objective measures used in my analysis may not reflect the true economic well-being of women aged 60 and over in China in the same way as the subjective measures. Although in section 2.3.3.2 I elaborate on the fact that the objective measures of economic well-being I have chosen (wealth ownership status and informal work status) are reflective of both individual and household economic well-being, as well as the impact of the household on individual economic well-being. However, due to the limitations of the operationalisation methodology (see section 4.2.2.4 for a detailed discussion), I can only measure whether Chinese women aged 60 and over own household wealth, but their share of household wealth is not clear. In addition, the measure of informal
work status only reflects the presence or absence of informal work, and does not capture those who may not be economically well off but are unable to work outside the home (due to their own limitations or because family members do not allow them to do so). Therefore, there is some measurement error in the objective measure of economic well-being in this thesis. While the objective measure of economic well-being used in this thesis captures the impact of the household on the economic well-being of these women, it is not as sensitive to capturing the extent of this impact as the subjective measure of economic well-being. Thus, subjective measures of economic well-being are more reflective of the true economic well-being of Chinese women aged 60 and over, particularly the role of the household in influencing their economic well-being.

4.4 Statistical methods used in the analysis

4.4.1 Fixed effects model
One of the aims of this study was to examine the relationship between changes in living arrangement and well-being deprivation scores for women aged 60 years and over in China. The fixed effects model has certain advantages over the ordinary least squares (OLS) regression and growth curve models in longitudinal studies (Halaby, 2003). This is because it controls for all observed and unobserved stable characteristics of individuals (Allison, 2009). It can focus on repeated observations of the same individual over time, which is particularly important for the analysis of well-being. This is because unobserved common determinants of well-being, such as personality, can lead to spurious correlations. The specific model measurements are as follows.

Equation 4-5 Fixed effects model

\[ y_{it} = \beta_0 + \beta_1 x_{it} + v_i + e_{it} \]

Under the fixed effects model, no assumptions are made about \( v_i \) except that they are fixed parameters. In other words, in the fixed effects model, there is no need to be concerned about the effect of \( v_i \) on \( x_i \). However, if \( v_i \) has no effect on \( x_i \), then
the random-effects model can be used.

The choice of panel model needs to be considered in the regression process because the choice will affect the results. The choice between a pooled OLS model, a fixed effects model, or a random-effects model can be verified by the F-test and the Hausman test. The difference between the fixed effects model and random effects model lies in the intercept term and the correlation between the explanatory variables. Therefore, in the selection of the panel model form, the F-test is used to determine the chosen from pooled OLS regression and random effects models, and the Hausman test is used to determine whether fixed effects or random effects should be established. In a comparison of the coefficients of the two models, if prob > chi2 is found to be significant (it takes a value below 0.05), then the fixed effects model is used. Otherwise, the random-effects model can be used (Mehmetoglu & Jakobsen, 2016).

However, it should be noted that the fixed effects model also has a disadvantage: it cannot estimate the effects of variables that do not vary over time, such as geographic variables and gender. These are often well worth studying in the social sciences (Mehmetoglu & Jakobsen, 2016).

4.4.2 Multiple linear regression analysis

Multiple linear regression analysis can be used to test the relationship between a continuous dependent variable and two or more continuous/categorical variables (Mehmetoglu & Jakobsen, 2016). As mentioned in section 4.3.2, the dependent variable (economic well-being) used in the analysis in Chapter 6 is a continuous variable and therefore it is more appropriate to use this model in this analysis. The equation for this model is as follows:

\[ y = \beta_0 + \beta_1 x_1 + \cdots + \beta_n x_n + \varepsilon \]

\( y \) is the dependent variable. \( \beta_0 \) is the intercept of \( y \), which represents the value of
\( y \) when all parameters are 0. \( \beta_1 \) is the coefficient of the first independent variable \( (x_1) \), which represents the effect of that independent variable on the predicted \( y \) value. \( \varepsilon \) is the model error which represents how much variance in the estimate of \( y \).

It is important to note that in the analysis, the interpretation of results uses standardised coefficients (beta) rather than the coefficients mentioned above. This is because the independent variables in the model include both continuous and categorical variables using different units of measurement. To be able to compare the relative importance of these variables, standardised coefficients are used when reporting the results. The interpretation of the standardised coefficient (beta) is that a decrease/increase of one standard deviation in the dependent variable is associated with a decrease/increase of beta standard deviation in the predicted dependent variable.

In addition, the positive or negative relationship between the independent and dependent variables is determined by the positive or negative signs of the standardised coefficients. Also, when examining the strength of the relationship between the independent and dependent variables, a standardised coefficient less than or equal to 0.09 is considered a weak relationship; a standardised coefficient between 0.1 and 0.2 is considered a moderate relationship; and when the standardised coefficient is greater than or equal to 0.2 it is considered a strong relationship (Mehmetoglu & Jakobsen, 2016).

There are several conditions that need to be met in order to use this method. First, the magnitude of the prediction error must not vary significantly across the different values of the independent variables, i.e., homoscedasticity. Second, the relationship predicted by the model must be linear; non-linear relationships cannot be predicted by the model. Third, the data should conform to a normal distribution. Fourth, the independent variables used are independent of each other. To make the model
predictions accurate, the data were examined with strict reference to these
guidelines. In particular, the variance inflation factor (VIF) is used to test for
collinearity between explanatory variables to avoid multiple collinearities between
independent variables, which could compromise the reliability of the estimated
coefficients. A value greater than 0.2 is generally considered preferable (Andreß et
al., 2013).

Typically, \( R^2 \) is used in OLS regression to assess the percentage of variance
explained by a set of predictors. In this study, the adjusted \( R^2 \) is used when
examining the fit of the model. This is because increasing the number of
independent variables in the model, regardless of whether these independent
variables are correlated with the dependent variable or not, will significantly
increase \( R^2 \) (Pedace, 2013). This can lead to misinterpretation of the explanatory
power of the model, so an adjusted \( R^2 \) is used to avoid this problem.

### 4.4.3 Logistic regression model

The dependent variable used in the analyses in Chapter 7 is a dummy variable. There
is a non-linear relationship between the independent and dependent variables.
Using OLS regression would violate its assumption of a linear relationship between
the variables (Andreß et al., 2013), hence the preference for categorical multivariate
discrete choice models in the analysis. Typically, two forms of categorical
multivariate discrete choice models can be chosen: the logit distribution model and
the probit distribution model. Because logistic regression assumes a form of random
utility distribution that is more appropriate when utility is maximised, it is more
widely used than the probit model (Mehmetoglu & Jakobsen, 2016). Therefore,
logistic regression was preferred in the analysis. The model was set up as follows:

**Equation 4-7 Logistic regression model**

\[
L_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \beta_3 x_{3i} + \cdots + \beta_{k-1} x_{k-1,i}
\]

Because log odds coefficients are not easy to interpret, I instead interpreted the
variable coefficients in my analysis using Odds Ratios (OR). These were obtained by
exponentiating the log odds coefficients (see Equation 4-8). The interpretation of the coefficients is different from the interpretation of the coefficients in linear regression, where the coefficients before $x$ refer to the natural logarithm(e) of the odds for $Y = 1$ changes for each unit in $x$.

**Equation 4-8 Odds ratios**

$$OR = \frac{\text{odds after a unit change in } X}{\text{original odds}}$$

Here, the coefficient before $x$ can be interpreted as the increase in odds for $Y$ for a unit increase in $x$. For example, if OR = 1, it means that the variable has no effect on the dependent variable; if OR > 1 (e.g., 1.24), it means that the odds for $Y = 1$ increase by 24% for each step up on the independent variable. OR also captures the relative importance of each predictor variable in terms of its effect on the outcome of the dependent variable by comparing the magnitude of the OR (Menard, 2002).

Unlike OLS regression, $R^2$ is not applicable in logistic regression. $R^2$ is used in OLS regression to assess the percentage of variance explained by a set of predictors. However, in logistic regression, the variance of a categorical variable depends on the frequency distribution of that variable (Field, 2000), so $R^2$ cannot be used directly in logistic regression. Therefore, the use of Nagelkerge pseudo $R^2$ in logistic regression has been proposed. It differs from the $R^2$ used in OLS regression to account for the percentage of variance explained by the predictors in that it is used to measure the strength of association of the model, that is, the improvement of the model with the variables added compared to the null model.

Next, the Hosmer and Lemeshow goodness-of-fit test was used in my analysis to check the fit of a model. This method is often used to measure whether the model accurately predicts the dependent variable. When its value is insignificant, the model is good (Mehmetoglu & Jakobsen, 2016). Logistic regression assumes that no linear relationship exists between independent variables (Menard, 2002). Thus, the
variance inflation factor (VIF) is used to test for cointegration between explanatory variables to avoid multiple collinearities between independent variables, which could compromise the reliability of the estimated coefficients. A value greater than 0.2 is generally considered preferable (Andreß et al., 2013).

4.5 Limitations of the analytical approach

In the analysis, I was only able to run regressions on data by urban and rural areas. This means that only differences between urban and rural women aged 60 years and over could be represented in my research. However, China has 34 provincial administrative regions with cultural, economic and other differences between each. Therefore, it is better to use multi-level modelling by province or country to capture these regional differences and reduce model prediction bias. However, the sample size used in my analysis was too small to implement this method.

Next, because questions on subjective economic well-being were not asked in the second and third waves of the survey, I could only use cross-sectional analysis for the analysis of subjective economic well-being. I included variables in the model that needed to be controlled to reduce the interference of other variables in the relationship between the independent and dependent variables. But it is important to note that there were still variables that could not be controlled and that could have affected the model estimations.

In addition, the measure of well-being in this study is actually ill-being. Thus, the analysis does not capture the full picture of well-being for the group of women aged 60 years and over in China. In future research, if the variables used to measure well-being are all continuous variables, a comprehensive measure of well-being still needs to be developed.

4.6 Software for analysis

All analyses and presentation of tables and figures were mainly carried out using STATA version 15.1 software.
4.7 Summary

The focus of this chapter is on how to operationalise the concept of well-being in the CHARLS data. The chapter begins with a discussion of which variables from the CHARLS data are used to measure the measurement framework constructed in Chapter 2 for the well-being of women aged 60 years and over in China. During the exploration, it was found that subjective measures of economic well-being were only present in the 2011 CHARLS data. To fully examine the impact of living arrangements on the well-being of these women, a separate chapter (Chapter 6) is therefore included in this study to explore the impact of living arrangements on the economic well-being (both subjective and objective components) of these women using cross-sectional analysis. Section 4.2.2 of this chapter then compares the strengths and weaknesses of scaling techniques, fuzzy set theory, structural equation modelling and the A-F method in measuring well-being and explains that due to operationalisation difficulties, what this study measures is actually ill-being. A descriptive analysis of well-being deprivation scores for women aged 60 and over is then presented in section 4.2.3 of this chapter. By comparing deprivation in economic well-being with or without the inclusion of subjective economic well-being, it is found that there is a large proportion of Chinese women aged 60 and over who perceive themselves to be deprived in terms of economic well-being. This chapter then discusses the three statistical methods used in the thesis and the analysis software used. It concludes with a consideration of the limitations of the thesis' analytical approach. In the next chapter, the second research question in this thesis ‘How do changes in living arrangements affect the well-being of women aged 60 and over in China?’ will be explored.
Chapter 5 Living arrangements and the well-being of women aged 60 and over in China

5.1 Introduction

From this point onwards we formally enter the finding chapters of this thesis. The research in this chapter focuses on the relationship between changes in living arrangements and the level of well-being of women aged 60 and over in China. It answers the following four main research questions31:

**R1:** After controlling for other influencing factors, how does the shift from living with a spouse and adult children to other living arrangements affect different dimensions of well-being among women aged 60 and over in China? Are there urban-rural differences in this effect?

**R2:** After controlling for other influencing factors, how does the shift from living with a spouse to other living arrangements affect different dimensions of well-being among women aged 60 and over in China? Are there urban-rural differences in this effect?

**R3:** After controlling for other influencing factors, how does the shift from living with a spouse and adult children to other living arrangements affect the overall well-being of women aged 60 and over in China? Are there urban-rural differences in this effect?

**R4:** After controlling for other influencing factors, how does the shift from living with a spouse to other living arrangements affect the overall well-being of women aged 60 and over in China? Are there urban-rural differences in this effect?

Based on the discussion of the relevant literature on this research topic in section 1.3, the following hypotheses are derived.

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31 A discussion of why these four research questions were studied is detailed in section 1.4.
Shifting from living with a spouse and adult children to other living arrangements and different dimensions of well-being

Hypothesis 1: Shifting from living with a spouse and adult children to living alone is associated with a decline in levels of physical well-being, mental well-being and economic well-being.

Hypothesis 2: Shifting from living with a spouse and adult children to living with a spouse is associated with a decline in levels of physical well-being, mental well-being and economic well-being.

Hypothesis 3: Shifting from living with a spouse and adult children to living with adult children is associated with a decline in levels of physical well-being, mental well-being and economic well-being.

Hypothesis 4: Shifting from living with a spouse to living alone is associated with a decline in levels of physical well-being, mental well-being and economic well-being.

Hypothesis 5: Shifting from living with a spouse to living with adult children is associated with a decline in levels of physical well-being, mental well-being and economic well-being.

Hypothesis 6: Shifting from living with a spouse to living with a spouse and adult children is associated with an increase in levels of physical well-being, mental well-being and economic well-being.

Shifting from living with a spouse and adult children to other living arrangements and different dimensions of well-being

Hypothesis 7: Shifting from living with a spouse and children to living alone is associated with decreased overall levels of well-being.

Hypothesis 8: Shifting from living with a spouse and adult children to living with a spouse is associated with decreased overall levels of well-being.

Hypothesis 9: Shifting from living with a spouse and adult children to living with
adult children is associated with decreased overall levels of well-being.

**Shifting from living with a spouse to other living arrangements and overall level of well-being**

**Hypothesis 10**: Shifting from living with a spouse to living alone is associated with decreased overall levels of well-being.

**Hypothesis 11**: Shifting from living with a spouse to living with adult children is associated with decreased overall levels of well-being.

**Hypothesis 12**: Shifting from living with a spouse to living with a spouse and adult children is associated with increased overall levels of well-being.

It is important to note here that skipped-generation households as well as kinship households (See the discussion of these two types of living arrangements in section 1.4) are not examined as separate categories of living arrangements. This is because the number of these two households mentioned in section 1.4 is very small, with no more than 1% of the population aged 60 years and over living in such households. The sample size of those living in these types of households in the CHARLS data is also very small (see the discussion in section 5.2.1). Therefore, the women living in these types of households were excluded from the analysis.

The next section (section 5.2) discusses methods used in this chapter, including the sample, the variables used in the analysis, the treatment of missing values and statistical methods. Since this chapter uses self-constructed longitudinal weight, in section 5.4, a sensitivity check is made on this longitudinal weight. The results of the analysis are then reported in section 5.3 and discussed in section 5.5.

**5.2 Methods**

5.2.1 Data, sample, attrition and non-response

Three waves of CHARLS data were used in this analysis (see section 3.3.1 for a detailed description of the CHARLS data). They are for the three years 2011, 2013
and 2015, respectively. The population of my study was women aged 60 years and over. Therefore, women aged 60 and over first needed to be subsampled (see section 3.5 for a detailed discussion of subsampling). In addition, women aged 60 and over living in other types of living arrangements (skipped-generation households or kinship households) were excluded from the analysis. This is because the focus of this study is on the impact of adult children as well as spouses on the well-being of these women. Women aged 60 and over living in skipped-generation households or kinship households represent only 0.8% of the sample, which is too small to be analysed as a separate category within the types of living arrangements. The sample sizes after subsampling were 3,716, 3,167 and 2,776 in 2011, 2013 and 2015, respectively. For the analysis, I used a balanced sample of 2,776 women aged 60 and over. The use of balanced samples means that there are a large number of attritions. It can be seen that there were attritions in the sample size between the three years: there are nearly 15% of respondents ‘missing’ from the second wave and it is even worse in the third wave, where almost 25% of respondents are ‘missing’ from the third wave.

Attrition and non-response are two very common phenomena in longitudinal data, but such phenomena can lead to bias of sample representation if not handled carefully (De Vaus, 2001). It is mentioned in Chapter 4 that methods for dealing with such problems can be mitigated to some extent by the use of longitudinal weights (see the discussion in section 3.3.3 for more details), and so, I have used longitudinal weights in this analysis. Note that in CHARLS, only the second wave officially provides longitudinal weights that are non-response adjustment, and thus I used the self-constructed longitudinal weight in the analysis (section 3.3.3 discusses in detail how this weight was constructed). An analysis of sensitivity checks on this weight was in section 5.4.
5.2.2 Dependent variables

The dependent variables used in this chapter are the overall well-being deprivation scores and the well-being deprivation scores on each dimension of well-being (economic well-being, physical well-being and mental well-being). The descriptive analysis of these deprivation scores has been described in detail in section 4.3.1 and will not be repeated here.

5.2.3 Independent variables

In the questionnaire, the respondent was not asked directly about her living arrangements but was asked about other family members and their relationship to the respondent (e.g., parents, relatives, adult children or grandchildren). From the information on the relationship between these members and the respondent, I constructed the variable of living arrangements of women aged 60 years and over.

In addition, the main interest in this study is the transitions in living arrangements between women aged 60 years and above and their spouses as well as their adult children. In order to test these transitions in living arrangements presented in the hypotheses mentioned in section 5.1 (from living with spouse and adult children to other living arrangements, from living with spouse to other living arrangements), living arrangements were divided into four mutually exclusively categories:

a) Living alone
b) Living with a spouse (with or without grandchildren)
c) Living with adult children (with or without grandchildren)
d) Living with a spouse and adult children (with or without grandchildren)

It is important to note that this variable is not divided into seven mutually exclusively categories: living alone, living with a spouse only, living with spouse and grandchildren, living with adult children only, living with adult children and grandchildren, living with adult children and a spouse only and living with a spouse, adult children, and grandchildren. This is because when split into these seven
mutually exclusively categories, the sample sizes for the two categories of living with adult children only and living with a spouse and grandchildren are very small at 1.46% and 1.89% respectively (see Table 5-1). A sample size that is too small reduces the power of the study and increases the margin of error, which can render the study meaningless (Mehmetoglu & Jakobsen, 2016). Therefore, for the analysis, only these four mutually exclusively categories were used for living arrangements. As the review of the relevant research literature in section 1.3 revealed a separate effect of grandchildren on the well-being of women aged 60 and over, the variable of the numbers of grandchildren in the household was added to the model as a control variable to control for this effect.

Table 5-1 Living arrangements (A seven-category variable) (unweighted)

<table>
<thead>
<tr>
<th>Living arrangements</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living alone</td>
<td>13.6</td>
</tr>
<tr>
<td>Living with a spouse only</td>
<td>34.99</td>
</tr>
<tr>
<td>Living with adult children only</td>
<td>1.46</td>
</tr>
<tr>
<td>Living with adult children and grandchildren</td>
<td>13.61</td>
</tr>
<tr>
<td>Living with a spouse and grandchildren</td>
<td>1.89</td>
</tr>
<tr>
<td>Living with a spouse and adult children</td>
<td>12.55</td>
</tr>
<tr>
<td>Living with a spouse, adult children, and grandchildren</td>
<td>23.89</td>
</tr>
</tbody>
</table>

Source: Constructed by the authors based on 2011 data.

5.2.4 Control variables

5.2.4.1 Sociodemographic factors

In a review of previous literature on this topic, it was found that socio-demographic factors such as age, marital status, education level, place of residence and types of social benefit were included as control variables in the model (T. Chen, 2019; Deng et al., 2016; Ren & Treiman, 2015; Waidler et al., 2017; J. Wang et al., 2014). Therefore, these variables are also considered as control variables in this study. However, some minor adjustments have been made based on the practicalities of
the analysis, which are detailed below.

Age and square of age are used in the model because the women aged 60 years and above in the sample are all aged 60 and over, and here, the age variable has negative skewness that would be an effect of direct use on the model's predictions. Therefore, the square of age is added to control for this effect.

The measurement variable used for place of residence was primarily whether women aged 60 and over lived in rural or urban areas. Multilevel modelling should have been used given that the women were from different provinces and there was variation between these provinces, but the sample size was too small to apply this method in the analysis (see section 4.5 for a detailed discussion). In addition, place of residence (rural or urban) was not added directly to the model as a control variable, but rather the sample was divided into rural and urban in the analysis and regressed separately. This is because there are significant differences in culture, living arrangements and standard of living between urban and rural areas in China (see the discussion in section 1.2 for more details). The effect of living arrangements on the well-being of women aged 60 and over in urban areas may differ from its effect on the well-being of women aged 60 and over in rural areas, and therefore needs to be viewed separately.

As the model is a fixed effects model, variables that do not vary over time, such as education, are not included in the model as there is no within-person variance to compare. Marital status was excluded from the model as it was co-linear with living arrangements.

5.2.4.2 Support from non-coresident adult children

As mentioned in the section 1.3, the financial, instrumental and emotional support provided by non-coresident adult can also affect the level of well-being of women
aged 60 and over. And differences in the amount and intensity of support provided by these non-coresident adult may have a differential impact on the well-being of these women. Therefore, the financial, instrumental and emotional support provided by non-coresident adult children, as well as its intensity and frequency, also need to be controlled for in the model. However, measures of the amount and intensity of these supports were difficult to operationalise in the CHARLS data, so in the final model I used three dichotomous variables which asked whether or not that support was received for each type of support. Please see below for a detailed description.

In the CHARLS questionnaire, respondents were asked whether they regularly received financial support from non-coresident adult children in two main areas: support with goods and support with money. Respondents were also asked to report the amount of support they received ('How much money was received in total, based on the amount of money and the valuation of the goods'). Unfortunately, there were a large number of missing values for the variable amount of support (46.3% of respondents did not answer this question). The inclusion of this variable would have lost a large sample for analysis and therefore affected the accuracy of the model's prediction, so non-coresident adult children’s financial support was manipulated as a dichotomous variable (1=Received either monetary or material support from their non-coresident adult children as having financial support from their non-coresident adult children, 0=No non-coresident adult children or did not receive either monetary or material support from non-coresident adult children) in the analysis.

The CHARLS questionnaire did not include questions about the amount and frequency of instrumental support (help with ADLs and IADLs) received by respondents from non-coresident adult children. Therefore, in the model I only used the dichotomous variable to indicate whether or not they received instrumental support from non-coresident adult children.
The CHARLS questionnaire also asked respondents about their emotional interactions with their non-coresident adult children. In the questionnaire, respondents were asked whether each of their non-coresident adult children visited, called or emailed them and the frequency of these interactions (‘Almost every day’, ‘2-3 times a week’, ‘Once a week’, ‘Every two weeks’, ‘Once a month’, ‘Once every three months’, ‘Once every six months’, ‘Once a year’, ‘Almost never’ and ‘Other’). However, many respondents had more than one non-coresident adult children (37.2%) and each child did not interact with the respondent with the same frequency. It is therefore not possible to determine exactly how often respondents interact with their non-coresident adult children. There were also no questions in the CHARLS data about the intensity of the emotional support respondents received, such as how long each contact lasted and whether the contact was a polite greeting or an in-depth chatting. Therefore, the intensity of emotional support was not taken into account in my analysis. Also, although the frequency of emotional support can be taken into account, there may be differences the intensity of emotional support of each non-coresident adult child. Therefore, the frequency of emotional support is the only factor taken into account to represent the emotional support provided by non-coresident adult children in general. Finally, in my analysis, women aged 60 and over were considered to have emotional support from their non-coresident adult children regularly if they reported any of their non-coresident adult children visited, called or emailed them from the following list (‘Almost every day’, ‘2-3 times a week’, ‘Once a week’, ‘Every two weeks’, ‘Once a month’). Those who did not have any non-coresident adult children or who reported none of their non-coresident adult children visited, called or emailed them from the following list (‘Almost every day’, ‘2-3 times a week’, ‘Once a week’, ‘Every two weeks’, ‘Once a month’) were considered to have no regular emotional support from their non-coresident adult children.
Due to data limitations, there is some measurement error in the variables regarding the non-coresident adult children's financial support, instrumental support and emotional support. Firstly, for the non-coresident adult children's financial support, my measure only reflects whether or not the support is received. However, differences in the amount of financial support are not examined in depth. Therefore, it is not possible to determine whether the non-coresident adult children's financial support is episodic or stable over time. Also, the non-coresident adult children's financial support is provided to the whole household and therefore it is not possible to determine whether the impact of this support on the well-being of women aged 60 and over is consistent with that of other household members. As it was mentioned in the previous section 2.3.3 that resources within the household are not always equally distributed, it is not known whether and to what extent women aged 60 and over receive this support. Secondly, there is no measure of the amount of instrumental support that the non-coresident adult children provide to women aged 60 and over, and therefore it is not possible to examine the impact of differences in the amount of that support on the well-being of these women. Also, with regard to the emotional support variable, although this variable contains a measure of the frequency of support, it does not represent the frequency of support given to that mother by each non-coresident adult child. It only reflects the general behaviour of non-coresident children. Therefore, it is not possible to determine how the impact on the well-being of women aged 60 and over changes when the emotional support of each child is taken into account.

Because of the limitations of the data, the variables on the non-coresident adult children’s financial support, instrumental support and emotional support do not provide a complete picture of the amount and intensity of these supports.

In order to minimise the impact of not taking into account the amount and intensity of support from these non-coresident adult children on the model predictions, I also
included the number of adult children who are non-coresident but living close to their parents in the model. This is because the geographical distance of the non-coresident adult children from their parents could also affect the frequency of support they provided for their parents (see discussion in section 1.3 for details). Note that this variable was not split here into the number of non-coresident adult children and the distance from these children. This is because the CHARLS data uses a categorical variable to ask respondents about distances from their non-coresident adult children. One of the categories responds to children living with the respondent. Therefore, using this categorical variable would have collinearity with the variable of living arrangements mentioned in section 5.2.3, which would affect the results of the analysis. So in this analysis, the number of non-coresident adult children was combined with the geographical distance of these children from their parents to form a variable measuring the number of adult children who live nearby.

5.2.4.3 Family-related factors
It has already been mentioned in section 5.2.3 above that due to sample limitations, the effect of grandchildren on well-being needs to be controlled for by adding the variable of the number of grandchildren in the household to the model. Furthermore, in some studies, it has been noted that an increase in household size significantly reduces the incidence of poverty among women aged 60 and over (Deng, Bi & Nie, 2019). However, as the variable of the number of grandchildren has been included in the model, the number of other members of the household (number of household members minus the number of grandchildren) was included in the analysis to avoid co-linearity.

Numerous studies have shown the correlation between household income level and well-being, i.e., the higher the household income level, the higher the level of the well-being of the individual (Chan et al., 2002; Hansen et al., 2008; Lei et al., 2011;
Litwin & Sapir, 2009; Žiković, 2020). In the analysis, I use total household\textsuperscript{32} incomes in the model. This figure represents net income before housing costs (net income BHC)\textsuperscript{33}. It includes all incomes from family members (including pensions, health insurance, other benefits, and financial assets), incomes from social benefits at the household level and income from financial assets at the household level.

Here, there is a transparency issue related to incomes in the CHARLS data. In cleaning up the data, I found some problems with the official income variables given by CHARLS. The official CHARLS data gives the original measure of income and the constructed income variables. However, the constructed income variables given by CHARLS shows only total values and does not explain how the variable was constructed. The missing values on these variables are questionable. Accurate income information is generally difficult to obtain from questionnaires due to the reluctance of respondents to answer or poor memory, thus there are generally many missing values for income variables (Hermalin, 2003b). However, the official constructed income variables have missing values for personal incomes and total household incomes of only 1.99\% of the total sample (see Table 5-2). It is stated that the data for these variables had been imputed, but it is not clear how they did it.

**Table 5-2 Officially constructed income variables from CHARLS (£1 equals about 9.15 RMB)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
<th>Percent Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual income</td>
<td>17,355</td>
<td>12,132</td>
<td>41,103</td>
<td>-1,893,600</td>
<td>2,602,400</td>
<td>1.99</td>
</tr>
<tr>
<td>Household total income</td>
<td>17,355</td>
<td>38,512</td>
<td>80,154</td>
<td>-1,749,000</td>
<td>2,626,400</td>
<td>1.99</td>
</tr>
</tbody>
</table>

\textsuperscript{32} A household is a ‘single person or group of people living at the same address as their only or main residence, who either share one meal a day together or share the living accommodation (i.e. living room) (Department for Work and Pensions 2014a: 227).

\textsuperscript{33} There is a difference between net income before housing costs (net income BHC) and net income after housing costs (net income AHC). The definition of BHC is the one used by international organisations such as Eurostat and the OECD, and the data provider CHALRS is consistent with this definition.
To ascertain the accuracy of the household income variable, I compared the officially constructed household income variable and the household income variable constructed by myself. There were considerable differences between the missing values. At the same time, I discovered a third-party organisation (Gateway to Global Aging: https://g2aging.org/) that specialises in harmonising CHARLS data. Therefore, after comparing my constructed household income variable, the third-party constructed household income variable and the official CHARLS constructed household income variable, I found that my constructed household income variable was the same as the third-party constructed household income variable but differed from the CHARLS constructed household income variable in terms of missing values and means (see Appendix A5-1).

The official household income variable constructed by CHARLS has a larger mean and much fewer missing values than the household income variable constructed by me and the third party. This may be due to the fact that the official CHARLS data are imputed. But since it does not state how this variable was imputed and this constructed household income variable is not officially given in the 2015 data. I have therefore used my own constructed household income variable in my analysis (the way in which total household income variable was constructed is also listed in Appendix A5-2).

Note that for the calculation of household members' income, I used 'monthly income multiplied by 12' to construct the individual's income. This is because I assume that they receive this type of income 12 months per year. However, some people may not receive income every month. But since the CHARLS questionnaire does not ask the respondents the number of months in which they received income, it is not possible to know exactly how much income the respondent received. This is
also a measurement error on this variable to be aware of.

5.2.4.4 Social cohesion
Social cohesion was also identified as a variable need to be control for in the literature review in section 1.3. In the (Burnette et al., 2021) study, social cohesion was measured as a score by measuring the frequency of respondents' involvement in local or school affairs, participation in groups, clubs, etc., interactions with neighbours and interactions with friends and relatives. Unfortunately, similar questions about social cohesion are not asked in the CHARLS data and therefore social cohesion is not included in the model.

5.2.4.5 Individual living arrangement preferences
From the literature review in section 1.3, we know that individual living arrangement preferences also influence the impact of living arrangements on individual well-being and therefore need to be included in the model as a control variable as well. However, the variable on personal preference for living arrangements only appears in the data for two years, 2011 and 2013, and this question was dropped from the 2015 questionnaire. Therefore, in this analysis, this variable was not added to the model. However, one of the advantages of using a fixed effects model is that it can control for individual characteristic variables to reduce the effect that individual characteristics have on the predicted results (see section 4.4.1 for a detailed discussion). Therefore, although individual living arrangement preferences were not added to the model in this analysis, the effect on the estimates of the results was not substantial.

5.2.5 Missing data
Most of variables used in the analysis did not have many missing values (see Table 5-3 and Table 5-4) and none of the missing values exceeded 10%. Thus, I applied casewise/listwise deletion to exclude them from the fixed effects regression analysis. However, the missing values for the variable of total household income are very
high, with 32.70% of rural and 31.04% of urban respondents missing on this variable. Using casewise/listwise deletion on this variable would result in a loss of more than 30% of the sample, which is undesirable. Given this issue, it may be possible to use imputation techniques to compensate for the missing responses. However, given the scope and limited time available within this PhD study, these aspirations have been deferred for the time being and will probably be achieved through postdoctoral research. In order not to lose information on this sample of more than 30%, the missing values are divided into a separate group in the analysis, i.e., total household income was recoded into a 6-category variable (‘Bottom quintile’, ‘Second lowest quintile’, ‘Middle quintile’, ‘Second highest quintile’, ‘Top quintile’, ‘Missing’).

Table 5-3 Descriptive statistics for categorical variables for models predicting women aged 60 years and over’s multi-well-being deprivation scores

<table>
<thead>
<tr>
<th>Variables</th>
<th>Urban (N=3,009)</th>
<th>Rural (N=5,319)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean or Percentage</td>
<td>Mean or Percentage</td>
<td></td>
</tr>
<tr>
<td>Living arrangement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living alone</td>
<td>13.28</td>
<td>14.89</td>
</tr>
<tr>
<td>Living with spouse</td>
<td>35.32</td>
<td>33.79</td>
</tr>
<tr>
<td>Living with children</td>
<td>27.14</td>
<td>22.21</td>
</tr>
<tr>
<td>Living with spouse and children</td>
<td>24.23</td>
<td>28.92</td>
</tr>
<tr>
<td>Missing</td>
<td>0.02</td>
<td>0.19</td>
</tr>
<tr>
<td>Financial support from non-residence children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>21.41</td>
<td>34.28</td>
</tr>
<tr>
<td>Yes</td>
<td>70.3</td>
<td>53.61</td>
</tr>
<tr>
<td>Missing</td>
<td>8.30</td>
<td>9.11</td>
</tr>
<tr>
<td>Instrument support from non-residence children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>71.17</td>
<td>73.63</td>
</tr>
<tr>
<td>Yes</td>
<td>28.82</td>
<td>26.3</td>
</tr>
<tr>
<td>Missing</td>
<td>0.01</td>
<td>0.07</td>
</tr>
<tr>
<td>Emotion support from non-residence children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>62.24</td>
<td>57.55</td>
</tr>
<tr>
<td>Yes</td>
<td>37.67</td>
<td>41.96</td>
</tr>
<tr>
<td>Missing</td>
<td>0.09</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Source: Authors’ estimates based on data from CHARLS three waves.
Table 5-4 Descriptive statistics for the continuous variables for models predicting women aged 60 years and over’s well-being deprivation scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>Place of residence</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
<th>Percent Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Rural</td>
<td>5,318</td>
<td>70.4</td>
<td>7.5</td>
<td>60</td>
<td>102</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>3,009</td>
<td>70.7</td>
<td>7.2</td>
<td>60</td>
<td>98</td>
<td>0</td>
</tr>
<tr>
<td>Numbers of adult household members</td>
<td>Rural</td>
<td>5,319</td>
<td>3.1</td>
<td>1.6</td>
<td>1</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>3,009</td>
<td>2.8</td>
<td>1.5</td>
<td>1</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Numbers of grandchildren in the household</td>
<td>Rural</td>
<td>5,319</td>
<td>0.2</td>
<td>0.6</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>3,009</td>
<td>0.1</td>
<td>0.4</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Numbers of adult children living nearby</td>
<td>Rural</td>
<td>5,319</td>
<td>3.8</td>
<td>1.6</td>
<td>0</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>3,009</td>
<td>3.2</td>
<td>1.5</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Total household incomes</td>
<td>Rural</td>
<td>3,575</td>
<td>15,669.7</td>
<td>41,095.3</td>
<td>-62,410</td>
<td>1,300,300</td>
<td>32.79</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>2,075</td>
<td>36,187.2</td>
<td>64,211.7</td>
<td>-142,400</td>
<td>1,475,412</td>
<td>31.04</td>
</tr>
</tbody>
</table>

Source: Authors’ estimates based on data from CHARLS three waves.

5.2.6 Analytical statistics

This chapter uses panel data, and the choice of panel model needs to be considered in the regression process, as the choice of model affects the final results. In the analysis, the F-test and Hausman test are used to choose between a pooled OLS model, a fixed effects model or a random effects model. First, in the selection of the panel model form, the F-test is used to determine the pooled OLS regression and random effects models, followed by the Hausman test to determine whether fixed effects or random effects should be established. The p-value of the F-test indicator used to test for a non-pooled OLS model (whether urban or rural) is 0.000, which is less than 0.05. This, therefore, strongly rejects the original hypothesis, suggesting that the regression model needs to consider the panel structure of the data, and therefore the random effects model should be used rather than the pooled OLS model. In addition, a Hausman test was conducted to see if there was a significant
difference between the coefficients obtained from the fixed effects and random effects methods, with the hypothesis being that there was no significant difference. As the p-values of 0.000 (rural) and 0.0014 (urban) are less than 0.05, the results of the empirical analysis reject the hypothesis and accept the fixed effects at the 1% significance level, suggesting that the fixed effects model is a better fit for the data in this chapter. Also, using fixed effects regression, the effect of living arrangements is estimated based on the well-being deprivation scores of the same individuals at different points in time, thus controlling for personality and other unobserved factors that may influence the level of individual deprivation and the individual's choice of living arrangements. My model is applicable to understanding the relationship between the level of well-being deprivation scores and the living arrangements changes over time. See Chapter 4 for more discussion of fixed effects models.

It is also important to note that my model is a fixed effects linear regression model rather than a Tobit model, although my dependent variable takes values between 0 and 1. Tobit models are thought to outperform linear models in terms of the significant censoring found in time-use data (i.e., a large number of zeros). However, my dependent variable is not heavily populated with zeros. Studies have also suggested that the results obtained are generally similar regardless of the model (Tobit or linear) (Foster & Kalenkoski, 2013). The specific models are as follows:

**Equation 5-1 Moving from living with a spouse to other types of living arrangements**

$WDS_{it} = b_1 + b_2 living\ alone_{it} + b_3 living\ with\ adult\ children_{it} + b_4 living\ with\ adult\ children\ and\ a\ spouse_{it} + b_5 control\ variables_{it} + u_{it} + e_{it}$ (Rural)

$WDS_{it} = b_1 + b_2 living\ alone_{it} + b_3 living\ with\ adult\ children_{it} + b_4 living\ with\ adult\ children\ and\ a\ spouse_{it} + b_5 control\ variables_{it} + u_{it} + e_{it}$ (Urban)
Equation 5.2 Moving from living with spouse and adult children to other types of living arrangements

\[ W_{it} = b_1 + b_2 \text{living alone}_{it} + b_3 \text{living with a spouse}_{it} + b_4 \text{living with adult children}_{it} + b_i \text{control variables}_{it} + u_{it} + e_{it} \]  
(Rural)

\[ W_{it} = b_1 + b_2 \text{living alone}_{it} + b_3 \text{living with a spouse}_{it} + b_4 \text{living with adult children}_{it} + b_i \text{control variables}_{it} + u_{it} + e_{it} \]  
(Urban)

Where \( W_{it} \) is the well-being deprivation scores (overall well-being deprivation scores or deprivation scores on each dimension of well-being) measuring individual \( i \) at time \( t \), living with alone \( _{it} \) represents the state in which individual \( i \) is living alone at time \( t \), and control variables \( _{it} \) represents the control variables for individual \( i \) at time \( t \). \( u_{it} \) is the unobserved individual-level component, and \( e_{it} \) represents the measurement error.

5.3 Results

5.3.1 A descriptive analysis of the relationship between women aged 60 and over’s trajectories of transition in living arrangements and their well-being deprivation scores

As can be seen from Table 5-5, the most common transition trajectory in the sample over the three waves was from living with a spouse and adult children to living with a spouse only, and the opposite trajectory. Also in rural areas, the transition from living with a spouse to living alone was a more common trajectory for women aged 60 years and above, with approximately 16% of women aged 60 years and above following this trajectory over the three waves. In urban areas, however, only 4.6% of the sample moved from living with a spouse to living alone. The lowest proportion was from living with a spouse and adult children to living alone, followed by from living with a spouse and adult children to living with adult children only.
Changes in well-being deprivation scores show that these scores (overall well-being deprivation scores, deprivation scores on each well-being dimension) tend to increase for women aged 60 and over on the transition trajectory without a spouse (e.g., from living with a spouse to living alone, and from living with a spouse to living with adult children), implying a decrease in their level of well-being. The presence of adult children (e.g., from living with a spouse to living with adult children and from living with a spouse and adult children to living with adult children) also tended to increase the well-being deprivation scores of women aged 60 and over, suggesting that living with adult children may have a negative impact on the well-being of women aged 60 and over. However, further testing is needed. The next section therefore presents a fixed effects regression analysis of the relationship between living arrangements and the well-being of women aged 60 and over.
### Table 5-5 The relationship between women aged 60 years and over’s trajectories of transition in living arrangements and their well-being deprivation scores

<table>
<thead>
<tr>
<th></th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overall</td>
<td>Physical</td>
</tr>
<tr>
<td>Living with a spouse to living alone</td>
<td>-0.021</td>
<td>0.014</td>
</tr>
<tr>
<td>Living with a spouse to living with adult children</td>
<td>0.170</td>
<td>0.041</td>
</tr>
<tr>
<td>Living with a spouse to living with a spouse and adult children</td>
<td>0.010</td>
<td>0.003</td>
</tr>
<tr>
<td>Living with a spouse and adult children to living alone</td>
<td>0.123</td>
<td>0.013</td>
</tr>
<tr>
<td>Living with a spouse and adult children to living with a spouse</td>
<td>-0.024</td>
<td>-0.008</td>
</tr>
<tr>
<td>Living with a spouse and adult children to living with adult children</td>
<td>-0.024</td>
<td>0.053</td>
</tr>
</tbody>
</table>

*Source: Constructed by the authors based on CHARLS three wave data.*
5.3.2 Results of a fixed effects model of the relationship between living arrangements and well-being among women aged 60 and over

5.3.2.1 From living with a spouse to other types of living arrangements

As can be seen from Table 5-6, for rural women aged 60 and over, the change from living with a spouse to living alone significantly increased their overall well-being deprivation score by 0.038 at p-values less than 0.05. This finding is consistent with Hypothesis 10, which suggests that the overall well-being of rural women aged 60 and over is reduced by the absence of a spouse. In addition, an interesting finding was that changing from living with a spouse to living with adult children increased the overall well-being deprivation score of rural women aged 60 and over by 0.053 at a p-value of less than 0.05. This finding confirms Hypothesis 11 that the change from living with a spouse to living with adult children has a negative impact. However, the change from living with a spouse to living with a spouse and adult children (i.e., children joining the family) had no effect on the overall well-being level of rural women aged 60 and over. This finding contradicts Hypothesis 12.

The impact of the change in living arrangements on the different dimensions of well-being of women aged 60 years and over in rural areas was not the same. Firstly, the change from living with a spouse to living alone did not affect the physical well-being of these women (the result is not significant), but it had a considerable negative impact on their mental well-being (mental well-being deprivation scores increased significantly by 0.114 at a p-value of less than 0.01). But at the same time, this change in living arrangements had some positive effects on their economic well-being, with their economic well-being deprivation scores decreasing by 0.046. But this positive effect was only significant at p-values less than 0.1. These findings partially support Hypothesis 4.

Secondly, changing from living with a spouse to living with adult children significantly
increased the deprivation score of physical well-being for women aged 60 years and over in rural areas at a p-value of less than 0.05 (coefficient = 0.048) and also significantly increased the deprivation score of mental well-being for these women at a p-value of less than 0.1 (coefficient = 0.086), but not economic well-being. This suggests that changing from living with a spouse to living with adult children reduces the physical and mental well-being of women aged 60 years and over in rural areas. These findings partially support Hypothesis 5.

Third, there was no relationship between changing from living with a spouse to living with a spouse and adult children and the level of physical well-being, mental well-being and economic well-being of women aged 60 years and over in rural areas. This finding rejects Hypothesis 6.

Table 5-6 The relationship between living arrangements and well-being among rural women aged 60 and over (from living with spouse to other types of living arrangements) (fixed effects model) (weighted)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Overall well-being</th>
<th>Physical well-being</th>
<th>Economic well-being</th>
<th>Mental well-being</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living arrangement (reference group: living with spouse)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living alone</td>
<td>0.038**</td>
<td>0.011</td>
<td>-0.046*</td>
<td>0.114***</td>
</tr>
<tr>
<td></td>
<td>(1.98)</td>
<td>(0.57)</td>
<td>(-1.77)</td>
<td>(3.02)</td>
</tr>
<tr>
<td>Living with children</td>
<td>0.053**</td>
<td>0.048**</td>
<td>0.007</td>
<td>0.086*</td>
</tr>
<tr>
<td></td>
<td>(2.05)</td>
<td>(2.13)</td>
<td>(0.21)</td>
<td>(1.74)</td>
</tr>
<tr>
<td>Living with spouse and children</td>
<td>0.015</td>
<td>0.002</td>
<td>0.030</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>(1.04)</td>
<td>(0.09)</td>
<td>(1.39)</td>
<td>(0.40)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.004</td>
<td>0.014</td>
<td>-0.004</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>(-0.38)</td>
<td>(0.75)</td>
<td>(-0.29)</td>
<td>(0.09)</td>
</tr>
<tr>
<td>Age square</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(-0.32)</td>
<td>(-0.68)</td>
<td>(-0.42)</td>
<td>(-0.54)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Instrument support from non-coresident adult children (reference group: No)</td>
<td>Emotional support from non-coresident adult children (reference group: No)</td>
<td>Numbers of adult household members</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Y</td>
<td>-0.005**</td>
<td>-0.022**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.71)</td>
<td>(-0.29)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-1.33)</td>
<td>(0.78)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(3.65)</td>
<td>(-1.87)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.24)</td>
<td>(1.28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-1.45)</td>
<td>(-0.61)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-1.46)</td>
<td>(-1.98)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-1.29)</td>
<td>(-0.82)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-1.40)</td>
<td>(-0.23)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-0.19)</td>
<td>(1.05)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1.88)</td>
<td>(-0.27)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.076</td>
<td>0.085</td>
</tr>
</tbody>
</table>
1. Robust t-statistics in parentheses

2. *** p<0.01, ** p<0.05, * p<0.1

3. Likelihood ratio test:
   a. Overall well-being: $F_{(16,2409)} = 4.81; \text{Prob} > F = 0.0000$
   b. Physical well-being: $F_{(16,2702)} = 2.67; \text{Prob} > F = 0.0003$
   c. Economic well-being: $F_{(16,3168)} = 4.12; \text{Prob} > F = 0.0000$
   d. Mental well-being: $F_{(16,2749)} = 6.01; \text{Prob} > F = 0.0000$

4. Hausman test:
   a. Overall well-being: $\text{Prob} > \text{chi}^2 = 0.0000$
   b. Physical well-being: $\text{Prob} > \text{chi}^2 = 0.0000$
   c. Economic well-being: $\text{Prob} > \text{chi}^2 = 0.0000$
   d. Mental well-being: $\text{Prob} > \text{chi}^2 = 0.0000$

Source: Authors’ own computation

**Table 5-7** reflects the impact of the change from living with a spouse to other forms of living arrangements on the well-being of urban women aged 60 and over. In contrast to the results in **Table 5-6** for rural women aged 60 and over, for urban women aged 60 and over, the change from living with a spouse to living alone did not have a significant impact on their deprivation scores for overall well-being. This is inconsistent with **Hypothesis 10**. Also, for urban women aged 60 and over, the change from living with their spouse to living with their adult children had no effect on their deprivation scores for well-being. This is also inconsistent with **Hypothesis 11**. In addition, moving from living with a spouse to living with a spouse and adult children had no effect on physical, health and mental well-being and overall well-being for urban women aged 60 and over, which is consistent with the rural findings. This finding also contradicts **Hypothesis 12**.

**Table 5-7** The relationship between living arrangements and well-being among urban women aged 60 years and over (from living with spouse to other types) (fixed effects model) (weighted)
<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Overall well-being</th>
<th>Physical well-being</th>
<th>Economic well-being</th>
<th>Mental well-being</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Living arrangement (reference group: living with spouse)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living alone</td>
<td>0.020</td>
<td>0.006</td>
<td>-0.041</td>
<td>0.097</td>
</tr>
<tr>
<td></td>
<td>(0.65)</td>
<td>(0.27)</td>
<td>(-1.27)</td>
<td>(1.41)</td>
</tr>
<tr>
<td>Living with children</td>
<td>-0.002</td>
<td>-0.028</td>
<td>-0.080</td>
<td>0.084</td>
</tr>
<tr>
<td></td>
<td>(-0.04)</td>
<td>(-0.73)</td>
<td>(-1.47)</td>
<td>(0.93)</td>
</tr>
<tr>
<td>Living with spouse and children</td>
<td>-0.002</td>
<td>-0.042</td>
<td>-0.004</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>(-0.06)</td>
<td>(-1.37)</td>
<td>(-0.09)</td>
<td>(0.07)</td>
</tr>
<tr>
<td>Age</td>
<td>0.009</td>
<td>0.048**</td>
<td>0.008</td>
<td>-0.035</td>
</tr>
<tr>
<td></td>
<td>(0.51)</td>
<td>(2.21)</td>
<td>(0.35)</td>
<td>(-1.02)</td>
</tr>
<tr>
<td>Age square</td>
<td>-0.000</td>
<td>-0.000**</td>
<td>-0.000</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(-0.81)</td>
<td>(-2.01)</td>
<td>(-0.62)</td>
<td>(0.63)</td>
</tr>
<tr>
<td><strong>Financial support from non-coresident adult children (reference group: No)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.003</td>
<td>0.001</td>
<td>-0.037**</td>
<td>-0.026</td>
</tr>
<tr>
<td></td>
<td>(0.35)</td>
<td>(0.05)</td>
<td>(-2.43)</td>
<td>(-1.37)</td>
</tr>
<tr>
<td><strong>Instrument support from non-coresident adult children (reference group: No)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-0.009</td>
<td>0.020</td>
<td>0.016</td>
<td>-0.039*</td>
</tr>
<tr>
<td></td>
<td>(-0.77)</td>
<td>(1.43)</td>
<td>(0.93)</td>
<td>(-1.70)</td>
</tr>
<tr>
<td><strong>Emotional support from non-coresident adult children (reference group: No)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-0.016</td>
<td>-0.043</td>
<td>-0.010</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(-0.58)</td>
<td>(-1.59)</td>
<td>(-0.26)</td>
<td>(0.00)</td>
</tr>
<tr>
<td><strong>Numbers of adult household members</strong></td>
<td>-0.009**</td>
<td>-0.001</td>
<td>-0.008</td>
<td>-0.013*</td>
</tr>
<tr>
<td></td>
<td>(-2.37)</td>
<td>(-0.31)</td>
<td>(-1.46)</td>
<td>(-1.78)</td>
</tr>
<tr>
<td><strong>Numbers of grandchildren in the households</strong></td>
<td>0.109***</td>
<td>0.002*</td>
<td>0.098**</td>
<td>-0.028**</td>
</tr>
<tr>
<td></td>
<td>(3.84)</td>
<td>(0.04)</td>
<td>(1.28)</td>
<td>(-1.08)</td>
</tr>
<tr>
<td><strong>Numbers of adult children live nearby</strong></td>
<td>-0.005</td>
<td>-0.005</td>
<td>0.000</td>
<td>-0.003</td>
</tr>
<tr>
<td></td>
<td>(-0.72)</td>
<td>(-0.54)</td>
<td>(0.00)</td>
<td>(-0.21)</td>
</tr>
<tr>
<td><strong>Total household income level (reference group: Bottom quintile)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second lowest quintile</td>
<td>-0.004</td>
<td>0.018</td>
<td>-0.007</td>
<td>-0.021</td>
</tr>
<tr>
<td></td>
<td>(-0.27)</td>
<td>(1.04)</td>
<td>(-0.33)</td>
<td>(-0.65)</td>
</tr>
</tbody>
</table>
Middle quintile  -0.034**  -0.005  -0.018  -0.057*  
       (-2.19)  (-0.21)  (-0.87)  (-1.76)
Second highest quintile  -0.012  0.016  -0.004  -0.040
       (-0.75)  (0.70)  (-0.17)  (-1.26)
Top quintile  -0.017  0.019  0.006  -0.027
       (-1.06)  (0.77)  (0.25)  (-0.78)
Missing  0.002  0.016  -0.000  -0.016
       (0.14)  (1.07)  (-0.00)  (-0.60)
Constant  0.164  -1.471*  0.095  2.007
       (0.27)  (-1.88)  (0.12)  (1.60)
Observations  2,260  2,442  2,687  2,489
R-squared: within  0.067  0.057  0.082  0.096
Number of individuals  943  965  1,003  985

1. Robust t-statistics in parentheses
2. *** p<0.01, ** p<0.05, * p<0.1
3. Likelihood ratio test:
   a. Overall well-being: F (16,1301) = 1.85; Prob > F = 0.0209
   b. physical well-being: F (16,1461) = 2.06; Prob > F = 0.0081
   c. Economic well-being: F (16,1668) = 1.48; Prob > F = 0.0180
   d. Mental well-being: F (16,1488) = 3.01; Prob > F = 0.0001
4. Hausman test:
   a. Overall well-being: Prob>chi2 = 0.0000
   b. physical well-being: Prob>chi2 = 0.0000
   c. Economic well-being: Prob>chi2 = 0.0000
   d. Mental well-being: Prob>chi2 = 0.0000

Source: Authors’ own computation

5.3.2.2 From living with a spouse and adult children to other types of living arrangements

Tables 5-8 and 5-9 reflect the impact of moving from living with a spouse and adult
children to other living arrangements on the well-being of women aged 60 and over. For both urban and rural women aged 60 and over, moving from living with a spouse and adult children to living alone had no effect on their overall level of well-being. Also, moving from living with a spouse and adult children to living with a spouse had no effect on their overall well-being. However, moving from living with a spouse and adult children to living with adult children significantly increased the overall well-being deprivation scores of rural women aged 60 and over at a p-value less than 0.1 (coefficient = 0.038). However, this change had no effect on the overall well-being of urban women aged 60 and over. This phenomenon once again emphasises the role of spousal companionship in safeguarding the well-being of the rural women aged 60 and over. Combined with the findings in section 5.3.2.1, cohabitation with adult children appears to be detrimental to the well-being of women aged 60 years and over who are in rural areas.

In addition, the change from living with a spouse and adult children to other types of living arrangements has different effects on each dimension of well-being for women aged 60 and over. First, moving from living with a spouse and adult children to living alone has a positive effect on the economic well-being of rural women aged 60 and over (a significant decrease in economic well-being deprivation scores of 0.076 at a p-value of less than 0.05), but has a larger negative effect on their mental well-being (a significant increase in mental well-being deprivation scores of 0.101 at a p-value of less than 0.05). However, this change in living arrangements had no effect on the economic and mental well-being of urban women aged 60 and over. At the same time, the change from living with a spouse and adult children to living alone had no effect on the physical well-being of women aged 60 and over in either urban or rural areas.

Secondly, the shift from living with a spouse and adult children to living with a spouse only has no impact on the physical well-being, economic well-being or mental
well-being of women aged 60 and over in either urban or rural areas.

Thirdly, moving from living with a spouse and adult children to living with adult children significantly increases rural women aged 60 and over’s physical well-being deprivation scores (by 0.046 at p-values less than 0.05) and mental well-being deprivation scores (by 0.073 at p-values less than 0.1). However, this change in living arrangements had no effect on the physical and mental well-being of urban women aged 60 and over, but instead had a positive effect on their economic well-being, significantly reducing their economic well-being deprivation scores by 0.076 at p-values less than 0.01.

Table 5-8 The relationship between living arrangements and well-being among rural women aged 60 and over (from living with a spouse and adult children to other types) (fixed effects model) (weighted)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Overall well-being</th>
<th>Physical well-being</th>
<th>Economic well-being</th>
<th>Mental well-being</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living arrangement (reference group: living with a spouse and adult children)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living alone</td>
<td>0.023</td>
<td>0.009</td>
<td>-0.076**</td>
<td>0.101**</td>
</tr>
<tr>
<td></td>
<td>(0.92)</td>
<td>(0.39)</td>
<td>(-2.24)</td>
<td>(2.00)</td>
</tr>
<tr>
<td>Living with a spouse</td>
<td>-0.015</td>
<td>-0.002</td>
<td>-0.030</td>
<td>-0.012</td>
</tr>
<tr>
<td></td>
<td>(-1.04)</td>
<td>(-0.09)</td>
<td>(-1.39)</td>
<td>(-0.40)</td>
</tr>
<tr>
<td>Living with adult children</td>
<td>0.038*</td>
<td>0.046**</td>
<td>-0.023</td>
<td>0.073*</td>
</tr>
<tr>
<td></td>
<td>(1.77)</td>
<td>(2.39)</td>
<td>(-0.78)</td>
<td>(1.78)</td>
</tr>
</tbody>
</table>

Notes: 1. Control variables were added to this model. 2. The control variables are the same as in Table 5-6, this model just changes the reference category for the variable of living arrangements. The reference category for the living arrangement variable in Table 5-8 is changed from "living with spouse" to "living with spouse and adult children". The coefficients on the control variables are therefore the same, so they are not repeated here in the table.

Source: Authors’ own computation
Table 5-9 The relationship between living arrangements and well-being among urban women aged 60 and over (from living with a spouse and adult children to other types) (fixed effects model) (weighted)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Overall well-being</th>
<th>Physical well-being</th>
<th>Economic well-being</th>
<th>Mental well-being</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living arrangement (reference group: living with a spouse and adult children)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living alone</td>
<td>0.021</td>
<td>0.048</td>
<td>-0.037</td>
<td>0.093</td>
</tr>
<tr>
<td></td>
<td>(0.45)</td>
<td>(1.18)</td>
<td>(-0.62)</td>
<td>(1.01)</td>
</tr>
<tr>
<td>Living with a spouse</td>
<td>0.002</td>
<td>0.042</td>
<td>0.004</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(1.37)</td>
<td>(0.09)</td>
<td>(-0.07)</td>
</tr>
<tr>
<td>Living with adult children</td>
<td>-0.000</td>
<td>0.014</td>
<td>-0.076**</td>
<td>0.080</td>
</tr>
<tr>
<td></td>
<td>(-0.00)</td>
<td>(0.48)</td>
<td>(-2.28)</td>
<td>(1.18)</td>
</tr>
</tbody>
</table>

Notes: 1. Control variables were added to the model. 2. The same control variables as Table 5-8 above, so they are not repeated in this table either.

Source: Authors’ own computation

5.3.2.3 Control variables

Tables 5-6 and 5-7 reflect the effects of the control variables on the well-being of urban and rural women aged 60 years and over respectively. Firstly, increasing age has no effect on the overall well-being, economic well-being and mental well-being of rural and urban women aged 60 years and over. However, increasing age had a negative effect on the physical well-being of urban women aged 60 years and over (a significant increase in physical well-being deprivation scores of 0.048 at a p-value of less than 0.05), but had no effect on the physical well-being of rural women aged 60 years and over.

In terms of support for non-cohabiting adult children, I found that financial support had a positive effect on the overall level of well-being of rural women aged 60 and over, with a significant reduction of 0.026 in the overall well-being deprivation score.
for rural women aged 60 and over at \( p < 0.01 \). However, financial support had no effect on the overall level of well-being of urban women aged 60 and over. When looking at the effect of financial support on the dimensions of well-being, it was found that financial support had a significant effect on the level of mental well-being of rural women aged 60 and over, significantly reducing the mental well-being deprivation score by 0.056 at a \( p \)-value of less than 0.01. But it did not have a significant effect on the other two dimensions, physical well-being and economic well-being. Unlike rural women aged 60 and over, financial support had no effect on physical well-being and mental well-being for urban women, but significantly reduced economic well-being deprivation scores by 0.037 at \( p \)-values less than 0.05.

In addition, instrumental support had no effect on the overall well-being of rural as well as urban women aged 60 and over. But looking at the effect of this support on different dimensions of well-being revealed different results. Instrumental support had a positive effect on physical well-being for rural women aged 60 and over (significantly reducing physical well-being deprivation scores by 0.022 at a \( p \)-value of less than 0.05), but had no effect on the other dimensions of well-being. In the urban areas, instrumental support had a positive effect on the mental well-being of women aged 60 and over, but this effect only significantly reduced mental well-being deprivation scores by 0.039 at a \( p \)-value of less than 0.1. This support had no effect on other dimensions of well-being for women aged 60 and over in the urban areas. In addition, emotional support had no significant impact on the overall level of well-being of rural and urban women aged 60 years and over. It also had no effect on the dimensions of well-being of rural and urban women aged 60 and over.

It is worth noting that an increase in the number of adult household members had a weak positive effect on the level of mental well-being of rural women aged 60 and over (a significant reduction in mental well-being deprivation scores of 0.01 at a \( p \)-value of less than 0.1), but had no effect on the level of other dimensions of well-
being or on the overall level of well-being of these women. An increase in the number of adult household members also had a positive effect on the level of mental well-being of urban women aged 60 years and over (p<0.1, coefficient = -0.013). In addition to this, the increase in the number of adult household members also had a positive effect on the overall well-being of these women. However, this effect was very weak (a significant reduction in overall well-being deprivation scores of 0.009 at a p-value of less than 0.05).

It is also interesting to note that an increase in the number of grandchildren in the household significantly reduced the overall well-being of rural and urban women aged 60 and over (with a significant increase in overall well-being deprivation scores of 0.113 and 0.109 at a p-value of less than 0.01, respectively). However, the increase in the number of grandchildren in the household had different effects on the dimensions of well-being for urban and rural women aged 60 years and over. An increase in the number of grandchildren in the household had a positive effect on the physical well-being of rural women aged 60 and over (p<0.05, coefficient = -0.065), but a negative effect on their economic well-being (p<0.05, coefficient = 0.073) and mental well-being (p<0.01, coefficient = 0.081). The increase in the number of grandchildren in the household had a negative effect on both the physical well-being (p<0.1, coefficient=0.002) and economic well-being of urban women aged 60 years and over, and a more negative effect on economic well-being (p<0.05, coefficient=0.098), but a positive effect on the mental well-being of these women (p<0.05, coefficient=-0.028).

It was also surprising that the increase in the number of adult children living nearby had no impact on overall level of well-being or on the dimensions of well-being for either urban or rural women aged 60 years and over.

In addition, the shift in household income level was not associated with the overall
level of well-being of rural women aged 60 and over, but the shift from bottom quintile to other quintile significantly increased the level of mental well-being of these women (p<0.05, coefficient=-0.041; p<0.05, coefficient=-0.045; p<0.05, coefficient=-0.058; p<0.01, coefficient = -0.088). It is important to note that the shift from the bottom quintile to the missing category also significantly reduced the mental well-being deprivation score of these women (p<0.01, coefficient = -0.056), which should be interpreted in relation to the greater reluctance of wealthier individuals to answer income-related questions as mentioned in section 4.3.2. In addition, a shift in income level from bottom quintile to middle quintile also significantly reduced these women's deprivation scores for physical well-being (p<0.05, coefficient = -0.024).

The difference is that a shift in household income level is not as strongly associated with the level of mental well-being of urban women aged 60 years and over, with only a shift from bottom quintile to middle quintile reducing the mental well-being deprivation scores of these women (coefficient = -0.057), but this relationship is only significant at a p-value of less than 0.1. In addition, the shift from bottom quintile to middle quintile also significantly reduced the overall well-being deprivation score by 0.034 at a p-value of less than 0.05 for urban women aged 60 years and over.

5.4 Sensitivity check
As the CHARLS data did not provide longitudinal weights for the third wave data, I constructed my own longitudinal weights (see section 3.3.3 for a discussion of how this weight is constructed). Therefore, to verify the robustness of the results, I also did a sensitivity check on this constructed longitudinal weight. Table A5-3-1 and Table A5-3-2 (see Appendix A5-3) reflect the results without the inclusion of this constructed longitudinal weight. After comparing the results without the inclusion of weights with those with the inclusion of weights, it was found that the predicted outcomes of the variables in the model did not change substantially with the
inclusion of the constructed longitudinal weights. It should be noted that the effects of some variables on well-being became weaker or stronger, such as living arrangements, number of grandchildren within the household, etc. This may have been caused by the probability weight I used, so it is more common for the number of people in the categories of some variables to increase or decrease after using that weight. But there were no findings that changed from insignificant to significant, or vice versa. And the direction of the relationship between these significant results and well-being did not change either. So, it is fair to say that my regression results are robust and insightful.

5.5 Discussion

Previous studies have not reached a consensus on the relationship between living arrangements and the well-being of women aged 60 and over. By analysing the relationship between living arrangements, the overall level of well-being and the levels of the dimensions of well-being of women aged 60 and above in China, my findings suggest that living arrangements have a significant effect on the well-being of women aged 60 and over in China, but there are urban-rural differences. In addition, unlike previous analyses that only analysed the effect of living with adult children on the well-being of women aged 60 and over, this study also examined the role of spouses on the well-being of women aged 60 and over. This study found that spouses and adult children had different levels of influence on the well-being of women aged 60 and over. Of these, spouses have a huge role in safeguarding the well-being of rural older women, and thus spouses may be the main source of support for rural women aged 60 and over rather than their adult children. However, the role of spouses and adult children is not as pronounced for urban older women. Therefore, the main source of support for urban women aged 60 and over is likely to be their own.

For rural women aged 60 and over, the impact of living with a spouse on improving their overall level of well-being is significant and positive, while the loss of a spouse
can be a significant blow to the mental well-being of this group. Although the loss of a husband brings some improvement to the economic well-being of older women, it does not compensate for the decline in other dimensions of well-being and is therefore detrimental to their well-being in general. This finding is consistent with previous research that suggests that spouses are an important caregiving resource and emotional support for women aged 60 and over (Shen et al., 2013; Zhao & Li, 2019). However, for urban women aged 60 and over, the impact of spousal loss on women's overall well-being and on all dimensions of well-being was not significant. This finding is inconsistent with the findings of previous studies mentioned above. This suggests that there are urban-rural differences in the impact of spouses on the well-being of women aged 60 and over in China.

Unlike previous studies (Chan et al., 2002; Mutchler et al., 2015; Sun, 2002; Yamada & Teerawichitchainan, 2015), my study did not find that living with adult children had a positive impact on the well-being of women aged 60 and over. On the contrary, my findings show that living with adult children had a negative impact on the well-being of rural women aged 60 and over and no impact on the well-being of urban women aged 60 and over. For rural women aged 60 and over, living with adult children makes this negative impact particularly significant after the absence of their spouse. It manifests itself in a decrease in the overall well-being of these women, both in terms of physical well-being and mental well-being.

This may, first, reflect the fact that living with adult children can create conflict, which can negatively affect older women's well-being (Do & Malhotra, 2012; Lin & Chen, 2018; Russell, 2009; Thomas et al., 2017). In contrast, separation can satisfy preferences for privacy and independence between the two generations (Giles & Mu, 2007), resolving the conflict between the desire for privacy/independence and the need for family support (Lei et al., 2015).
Second, it may also reflect the fact that living with and receiving support from adult children may be conditional (Huang, 2018; Yan et al., 2003). In addition to enjoying the support provided by their adult children, women over 60 and over may often take on the responsibilities of caring for their grandchildren, and the increased caregiving burden on them to meet the needs of their offspring may leave them with less time to enjoy their own lives (Deng et al., 2016; Jiang et al., 2014; Wenger et al., 2007). This, in turn, has a negative impact on their own level of well-being (An et al., 2008; Deng et al., 2016; Jiang et al., 2014). This is reflected in the analysis, which shows that an increase in the number of grandchildren in the household significantly increases the overall well-being deprivation scores of urban and rural women aged 60 and over. In rural areas, an increase in the number of grandchildren in the household causes financial stress as well as mental strain on women aged 60 and over, while in urban areas, an increase in the number of grandchildren in the household causes financial stress and physical strain on women aged 60 and over.

The difference in the impact of living with adult children on the well-being of women aged 60 and over between urban and rural areas is also a reflection of the difference in living standards between urban and rural areas. Urban women aged 60 and over are likely to be less dependent on their children due to better community, childcare institutions and social security systems in urban areas compared to rural areas (See discussion in section 1.2). The negative effects of living with adult children may be offset by the effects of other factors that enhance the well-being of these women. For example, these women's mental well-being is enhanced by their active participation in social activities due to better community (Michael et al., 2001; Russell, 2009; Tang et al., 2020). In addition, more robust social security in urban areas has increased the economic status of these women and further increased their voice in the household (Jiang et al., 2014). Therefore, the effect of living with adult children on the well-being of urban women aged 60 and over is not significant. For rural women aged 60 and over, family support, especially from their spouses, is still
important when social welfare, community, etc. are still inadequate. When they lose their spouse, the negative impact of living with adult children becomes apparent because these women have to rely on their adult children as there is no strong social security.

These findings should be seen in the context of a number of limitations. First, the impact of other types of living arrangements, such as skipped-generation households and kinship households, on the well-being of women aged 60 and over is not clear due to the small sample size and the fact that these living arrangements were not included in the analysis. Future research may need to consider the impact of these living arrangements. Secondly, as the analysis was conducted separately for urban and rural areas, it is not possible to know the migration of women aged 60 and over between urban and rural areas. The migration of women aged 60 and over from rural to urban may also have some impact on their well-being due to the differences in living standards between rural and urban areas. This is something that could be considered in future research. Thirdly, the multilevel model could not be implemented in the analysis due to the limitations of the sample size. However, multilevel models could also be considered in future studies, as there are 34 administrative regions in China and multilevel models could capture more regional variation and reduce prediction bias. Fourth, although the fixed effects model used in this chapter captures the trajectory of changes in living arrangements, changes in living arrangements between the three survey waves (e.g., from living with a spouse to living alone first, then moving to living with children) are not known and only initial to final changes can be observed in the analysis. Fifth, due to measurement error in non-cohabiting adult children’s support and missing measures of the frequency and intensity of these supports, this study does not provide a good response to the impact of these non-cohabiting adult children’s supports on the well-being of women aged 60 and over. Further research is needed to examine non-cohabiting adult children’s support more comprehensively.
Another issue that is very much in need of attention is the selection issue. In the analysis, although my findings are that living with children has a negative impact on the overall level and dimensions of well-being of rural women aged 60 and over, a selection effect may be at work. As (Giles & Mu, 2007) and (Fan et al., 2018) point out, adult children of healthier or better-off parents may be more likely to be employed further away from home than those who have to stay closer to home (or return home) to provide assistance to parents with health or financial problems. Issues about selection effects should therefore be considered in future studies. This may require the inclusion of instrumental variables, such as the presence of residential preferences in the CHARLS data. However, given the time constraints of a PhD study, exploration of this issue could perhaps be undertaken later in the postdoc study.

Despite these limitations, this study draws on a more comprehensive dataset to detail the relationship between the living arrangements of women aged 60 and over and their well-being in China. It extends the previous literature by comparing the different type of living arrangements and their transition trajectories. The findings cast doubt on the conclusions reached by some studies that living with adult children improves the well-being of women aged 60 and over. Data from CHARLS show that rural women aged 60 and over have better levels of well-being when they live with their spouses. Living with adult children does not maintain better well-being for these women in the event of their spouse's absence, but may instead have a negative impact on their well-being. This is a very noteworthy phenomenon because in China today, although the government has implemented some policies to guarantee the welfare of the older people, these policies are very unfriendly to women and the government still advocates adult children’s support for the older people (Zhou, 2019). Therefore, the reduced level of well-being that may exist when living with adult children is a cause for concern.
Chapter 6 Living arrangements and economic well-being of women aged 60 and over in China

6.1 Introduction

The previous chapter focused on the relationship between the living arrangements of women aged 60 and over in China and their overall well-being as well as each well-being dimension. Modelling the trajectory of shifts in the living arrangements of women aged 60 and over in China revealed the important role of spouses in increasing these women's levels of well-being, while also reflecting that living with adult children may have no effect or a negative effect on these women's levels of well-being. In the previous chapter's exploration, however, the dimension of economic well-being was measured using only objective measures due to data limitations. Using objective measures of economic well-being alone does not provide a complete understanding of economic well-being. This chapter focuses on exploring whether the impact of living arrangements on the economic well-being of women aged 60 and over in China changes when subjective measures are added to economic well-being. As the subjective well-being measure is only present in the first wave of CHARLS data, this chapter is a cross-sectional analysis chapter. It cannot explore the impact of changes in living arrangements on the economic well-being of women aged 60 and over in China, as Chapter 5 does. Therefore, this chapter answers two main questions:

R1: After controlling for other influencing factors, how do living arrangements affect the level of economic well-being of women aged 60 and over in China?
R2: Are there urban-rural differences in this effect?
R3: Have these effects changed with the addition of subjective measures of economic well-being?
And based on the review of the relevant literature in section 1.3 and the findings in Chapter 5, the following hypotheses are formulated for the above research questions:

**Hypothesis 1:** For Chinese women aged 60 and over, the level of economic well-being is higher for those living with a spouse than for those living alone.

**Hypothesis 2:** For Chinese women aged 60 and over, the level of economic well-being is higher for those living with a spouse than for those living with adult children.

**Hypothesis 3:** For Chinese women aged 60 and over, the level of economic well-being is higher for those living with a spouse than for those living with a spouse and adult children.

**Hypothesis 4:** For Chinese women aged 60 and over, the level of economic well-being is higher for those living with adult children than for those living alone.

**Hypothesis 5:** For Chinese women aged 60 and over, the level of economic well-being is higher for those living with a spouse and adult children than for those living alone.

**Hypothesis 6:** For Chinese women aged 60 and over, the level of economic well-being is higher for those living with a spouse and adult children than for those living with adult children.

In the next section (section 6.2), I describe the sample size and variables used for the analysis and the analysis statistics. The results of the descriptive statistics and the multiple linear regression model are reported in section 6.3. In addition, in section 2.3.3.1 I mentioned that per capita household income cannot be used to measure the economic well-being of women aged 60 years and over in China. To support this claim, in section 6.4 of this chapter I compare the results of using the measure of per capita household income with the results of using the measure of economic well-being constructed in this chapter. Finally, I conclude the results of the analysis in this chapter in section 6.5.
6.2 Methods

Before moving on to the analysis section, here is a description of the data and methods used to answer the research questions in this chapter. It begins with an introduction to the data and subsampling process and then explains the variables used in the analysis. Finally, it shows the model I used to test my six hypotheses.

6.2.1 Data and sample

The data used in this chapter comes from the China Health and Retirement Longitudinal Study Baseline (CHARLS, 2011)\(^{34}\) as an independent cross-section. As the study population for this thesis is women aged 60 and over, the sample size was reduced to 3,719 older women after removing those who did not meet the requirements of the study population\(^{35}\). This chapter focuses specifically on the research question of whether the impact of living arrangements on economic well-being changes with the inclusion of subjective measures of economic well-being. Therefore, to ensure that the findings can be compared with those in Chapter 5, women aged 60 and over living in other types of living arrangements (skipped-generation households or kinship households) were excluded from the analysis. After removing these women, the sample was reduced to 3,712 women aged 60 and over, of which 2,181 were from rural settings, and 1,531 were from urban settings.

6.2.2 The dependent variable

Economic well-being is the dependent variable that is the focus of this chapter. It comprises an objective measure of economic well-being (consistent with the measure of economic well-being in Chapter 5) as well as a subjective measure (a subjective assessment of living standards\(^{36}\)). In this chapter, as was done in Chapter

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\(^{34}\) For a detailed description of this data, please see section 3.3.1.

\(^{35}\) The sub-sampling process is discussed in detail in section 3.5.

\(^{36}\) See section 4.2.1.3 for a detailed description of the measurement of subjective economic well-being.
5, deprivation scores are still used to calculate economic well-being, so that an increase in the deprivation score for economic well-being is interpreted to mean a decrease in the level of economic well-being. A detailed description of how this variable is operationalised in the CHARLS data was given in section 4.2.1.3, and a detailed description of the descriptive analysis of this variable was given in section 4.3.2, so it will not be repeated here.

6.2.3 Independent variables

The main variable of interest in this chapter is the living arrangements of women aged 60 and over in China. This chapter focuses on the research question of whether the impact of living arrangements on economic well-being changes after the inclusion of subjective measures of economic well-being. Therefore, in order to allow for comparison with the findings with Chapter 5, the independent variable living arrangements was operationalised in the same way as in Chapter 5, i.e., living arrangements were categorised into four mutually exclusive categories (see the detailed discussion in section 5.2.3 for the reasons why the choice was made to recode living arrangements into these four mutually exclusive categories):

a) Living alone
b) Living with a spouse (with / or without grandchildren)
c) Living with adult children (with / or without grandchildren)
d) Living with a spouse and adult children (with / or without grandchildren)

6.2.4 Control variables

Similarly, the choice of control variables remains largely the same as those used in Chapter 5, but with slight differences. This is because Chapter 5 features a longitudinal analysis and uses a fixed effects model. So the variable, education level, does not change over time and is excluded from the model. However, this chapter is a cross-sectional analysis, so the education level needs to be included in the model to control for its impact on the model predictions.
It is often assumed that people with higher levels of education are in higher paying jobs and therefore those with higher levels of education are more likely to be better off financially than those with lower levels of education (Chan et al., 2002; Li, Xu, et al., 2011). Respondents in the CHARLS questionnaire were asked about the highest level of education attained. It included a total of 10 possible levels of education, ranging from illiterate to PhD. Since the older women in this study did not have a very high level of education\(^{37}\) for socio-historical reasons, I reclassified the respondents to present an accurate picture of the educational level of the study group. The classifications are:

a) Illiterate

b) Able to read and write (did not complete primary school but could read and write)

c) Primary school (six years of schooling)

d) Junior high school or above (middle school, high school, vocational school, associate degree, bachelor's degree, master's degree, doctorate).

In addition, the personal preference for living arrangements mentioned in section 5.2.4.5 is not included in the model analysed in Chapter 5 as it does not appear in the third wave of CHARLS data. However, this variable appears in the first wave of CHARLS data used in this chapter and therefore this variable is included in the model as a control variable in this chapter.

In the CHARLS 2011 questionnaire, respondents were asked about what they thought was the most favoured form of living arrangement (‘What do you think is the best living arrangement for the elderly person?’). Respondents were also asked to choose an answer from 'Live with adult children', 'Don't live with them in the same house, but live in the same community or village', 'Don't live with them in the same house and the same community or village', 'Live in a nursing house' and

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\(^{37}\) See section 1.2.2 for more details.
'Other’. In the analysis, I added this question to the model as control variables.

It is important to note that the question on living arrangement preferences only asks whether the respondent would like to live with her adult children, but not whether she would like to live with her spouse. Therefore, the inclusion of this control variable in the model does not control for the effect of a respondent’s living arrangement preference with her spouse, as we cannot exclude the possibility that some respondents may not want to live with their spouse.

As the operationalisation of the remaining control variables in this chapter is the same as the operationalisation of these variables in Chapter 5, the specific operationalisation methods will not be repeated here. See Table 6-1 and Table 6-2 for a description of the variables used in this chapter.

6.2.5 Missing data

The treatment of missing values was also consistent with Chapter 5, i.e., variables without many missing values (no more than 10% missing values) (see Tables 6-1 and 6-2) were excluded from the multiple linear regression analysis using a casewise/listwise deletion method. For total household income, a variable with a very large number of missing values, I also used the same approach as in Chapter 5 to deal with missing values. That is, the missing values were divided into a separate group in the analysis. Thus, total household income becomes a six-category variable (‘Bottom quintile’, ‘Second lowest quintile’, ‘Middle quintile’, ‘Second highest quintile’, ‘Top quintile’, ‘Missing’).
<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Rural (N=2,181)</th>
<th>Urban (N=1,531)</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
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<td>Living with spouse</td>
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<td>34.50</td>
</tr>
<tr>
<td>Living with children</td>
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<td>20.70</td>
</tr>
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<td>Living with spouse and children</td>
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<td><strong>Living arrangements preferences</strong></td>
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</tr>
<tr>
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<td>Obs.</td>
</tr>
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<td>--------------------</td>
<td>--------</td>
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<tr>
<td>Numbers of household grandchildren</td>
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<td>Numbers of adult children living nearby</td>
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<tr>
<td></td>
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<td></td>
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</table>

Source: Author’s calculations using the CHARLS wave 1 (2011).

6.2.6 Analytical statistics

As the dependent variable used in this chapter is a continuous variable, a multiple linear regression model was used in the analysis. The introduction and testing methods for this regression model are described in detail in section 4.4.2 and will not be repeated here. Also, as was done in Chapter 5, this chapter uses a linear
regression model rather than a Tobit regression model (see section 5.2.6 for a detailed explanation of Tobit regression). This is because the dependent variable in this chapter still does not have a large number of zeros and therefore there is no need to use a Tobit regression model specifically.

In addition to this, one of the research priorities in this chapter is to investigate whether there are urban-rural differences in the impact of living arrangements on the economic well-being of women aged 60 and over in China. Therefore, this chapter analyses the sample of older women in urban and rural areas separately. This is also in line with the analytical approach in Chapter 5. In the analysis, two separate regression models are used to examine the relationship between living arrangements and the economic well-being of women aged 60 and over in China. They are Model 1 for rural women aged 60 and over and Model 2 for urban women aged 60 and over.

Equation 6-1 Model used for predicting the relationship between living arrangements and the economic well-being of women aged 60 and over

Model 1 (Rural): \[ EWDS = \beta_0 + \beta_1 \times \text{living alone} + \beta_2 \times \text{living with adult children} + \beta_3 \times \text{living with a spouse and adult children} + \sum \beta_i x_{control variables} + \varepsilon \]

Model 2 (Rural): \[ EWDS = \beta_0 + \beta_1 \times \text{living alone} + \beta_2 \times \text{living with adult children} + \beta_3 \times \text{living with a spouse and adult children} + \sum \beta_i x_{control variables} + \varepsilon \]

The EWDS in the above formulas is the economic well-being deprivation score.

All descriptive tables and figures in the analysis were weighted using the individual non-response correction (See the detailed discussion of this weighting in section 3.3.3). At the same time, it is important to note that the study is based on cross-sectional data, and therefore the results should not be interpreted as evidence of a causal relationship.
6.3 Results

6.3.1 Descriptive analysis of the relationship between the living arrangements of women aged 60 and over and their economic well-being deprivation scores

Table 6-3 describes the economic well-being of rural and urban women aged 60 years and over under different living arrangements. The table shows that for rural women aged 60 and over, the highest mean economic well-being deprivation score is 0.38 for those living with a spouse and adult children, while the lowest mean economic well-being deprivation score for women aged 60 and over is 0.28 for those living alone. This indicates that for rural women aged 60 and over, those living alone have the best economic well-being. However, for women aged 60 and over in urban areas, the situation is different. Urban women aged 60 and over have the highest level of economic well-being for those living with a spouse (economic deprivation score is 0.19) and the lowest level of economic well-being for those living with adult children (economic deprivation score is 0.26). In addition, urban women aged 60 and over had better levels of economic well-being than rural women aged 60 and over in each of the different living arrangements. The above findings need to be tested further. Therefore, the relationship between living arrangements and the economic well-being of women aged 60 and over will next be tested using a multiple linear model.
Table 6-3 The relationship between living arrangements and the economic well-being of women aged 60 and over (Weighted)

<table>
<thead>
<tr>
<th>Living arrangements</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living alone</td>
<td>0.28</td>
<td>0.22</td>
</tr>
<tr>
<td>Living with a spouse</td>
<td>0.37</td>
<td>0.19</td>
</tr>
<tr>
<td>Living with adult children</td>
<td>0.30</td>
<td>0.26</td>
</tr>
<tr>
<td>Living with spouse and adult children</td>
<td>0.38</td>
<td>0.21</td>
</tr>
</tbody>
</table>

*Source: Author’s calculations using the CHARLS wave 1 (2011)*

6.3.2 Results of a multiple linear regression model of the relationship between living arrangements and economic well-being of women aged 60 and over

In the multiple linear regression analysis (see Table 6-4), there were urban-rural differences in the impact of living arrangements on the economic well-being of women aged 60 and over. In rural areas, women aged 60 and over living alone had lower economic well-being deprivation scores than women aged 60 and over living with a spouse (coefficient = -0.062, p<0.01). This suggests that women aged 60 and over living alone have better economic well-being than those aged 60 and over living with a spouse, which rejects Hypothesis 1. Furthermore, the economic well-being of women aged 60 and over living with their adult children does not differ from that of those aged 60 and over living with a spouse. This finding is also inconsistent with Hypothesis 2. Not only that, but there was also no difference between the economic well-being of women aged 60 and over living with their spouses and adult children and the economic well-being of women aged 60 and over living with their spouses only. This point also refutes Hypothesis 3. In urban areas, however, the situation is different. There is no difference between the economic well-being of women aged 60 and over living alone or with adult children and women aged 60 and over living with a spouse. But women aged 60 and over living with a spouse and children had better levels of economic well-being than women aged 60 and over living with a
spouse (a significantly lower economic well-being deprivation score of 0.096 at a p-value less than 0.05). This also rejects **Hypothesis 3**.

Also, when comparing the economic well-being of women aged 60 and over living alone with that of women aged 60 and over living with adult children, it was found that in rural areas, living with adult children significantly increased economic well-being deprivation scores compared to living alone (significantly increasing economic well-being deprivation scores by 0.056 at the p-value less than 0.05 level). However, in urban areas, there was no difference in economic well-being between women aged 60 and over under these two living arrangements. In addition, the economic well-being of women aged 60 and over living alone differs significantly from that of women aged 60 and over living with a spouse and adult children. For rural women aged 60 and over, living with a spouse and adult children significantly increased the economic well-being deprivation score compared to living alone (a significant increase in the economic well-being deprivation score of 0.09 at the p-value of less than 0.05). However, for urban women aged 60 and over, the opposite result was observed. Living with a spouse and adult children significantly reduced economic well-being deprivation scores compared to living alone (a significant reduction in economic well-being deprivation scores of 0.098 at a p-value of less than 0.05). Thus, the findings for rural women are contrary to Hypothesis 5, but the findings for urban women confirm **Hypothesis 5**.

In addition, for rural women aged 60 and over, there is no significant difference in economic well-being between living with adult children and living with a spouse and adult children. However, for rural women aged 60 and over, living with adult children significantly reduces the level of economic well-being compared to living with a spouse and adult children (a significant increase in the economic well-being deprivation score of 0.05 at a p-value of less than 0.05).
The above findings show that for rural women aged 60 and over, those living alone have the best levels of economic well-being, with no differences between the economic well-being of women in the other types of living arrangements. For urban women aged 60 and over, those living with a spouse and adult children have the best economic well-being, with no differences between the economic well-being of women in the other types of living arrangements.

In addition, some interesting phenomena were found with regard to the control variables. Firstly, age does not impact the economic well-being of rural and urban women aged 60 and over. Furthermore, education does not impact the economic well-being of rural and urban women aged 60 and over. In addition, the impact of support from non-cohabiting adult children on the economic well-being of rural and urban women aged 60 and over differed. For rural women aged 60 and over, those who received financial support from non-cohabiting adult children had a somewhat higher level of economic well-being than those who did not receive that support (coefficient = -0.022), but this effect was only significant at a p-value of 0.1. In addition, instrumental support from non-cohabiting adult children had a significant effect on the economic well-being of both rural and urban women aged 60 and over, although the effect was greater for rural women aged 60 and over. Rural women who received this support had lower deprivation scores for economic well-being than women who did not receive this support (0.051 at the p-value less than 0.01 level). Similarly for urban women aged 60 and over, women who received instrumental support from a non-cohabiting adult child also had a lower deprivation of economic well-being score of 0.035 than women who did not receive this support, but this effect was only significant at a p-value of less than 0.1. In addition, the emotional support of non-cohabiting adult children only had an effect on the economic well-being of urban women aged 60 and over. That is, women who received this support had a lower well-being deprivation score than women who did not receive this support by 0.101 at the p-value less than 0.01.
It is also interesting to note that rural women aged 60 and over, whose first choice of living arrangement is a nursing home, have a lower level of economic well-being than rural women who prefer to live with their adult children (coefficient = 0.134, p<0.01).

In addition to this, an increase of the number of adults in the household significantly reduces the economic well-being deprivation score of 0.029 for rural women aged 60 and over at a p-value of less than 0.01. However, the number of grandchildren in the household significantly reduces the level of economic well-being of rural as well as urban women aged 60 and over (rural: coefficient = 0.024, p<0.01; urban: coefficient = 0.012, p<0.05). It is also interesting to note that the number of adult children living nearby has an opposite effect on the economic well-being of rural and urban women aged 60 and over. For rural women aged 60 and over, having more adult children living nearby significantly increased their level of economic well-being (coefficient=-0.007, p<0.1), whereas for urban women aged 60 and over, having more adult children living nearby decreased their level of economic well-being (coefficient=0.011, p<0.05).

A rather interesting finding from the analysis is that the relationship between household income and women aged 60 and over's economic well-being is only significant in the higher household income categories. Specifically, for both rural and urban women aged 60 and over, those in the second highest or top household income quintile (highest household income) had higher levels of economic well-being than those in the lowest income quintile (lowest household income). Also, in urban areas, those in the category of missing values had better levels of economic well-being than those in the lowest household income quintile. This finding is also the same as in Chapter 5, i.e., people at higher income levels are more reluctant to answer income-related questions.
Table 6-4 The relationship between living arrangements and economic well-being deprivation scores of women aged 60 and over (weighted)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living alone vs Living with spouse (ref.)</td>
<td>-0.062***</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>(-2.77)</td>
<td>(0.09)</td>
</tr>
<tr>
<td>Living with adult children vs Living with spouse (ref.)</td>
<td>-0.006</td>
<td>-0.046</td>
</tr>
<tr>
<td></td>
<td>(-0.20)</td>
<td>(-1.11)</td>
</tr>
<tr>
<td>Living with spouse and adult children vs Living with spouse (ref.)</td>
<td>0.029</td>
<td>-0.096**</td>
</tr>
<tr>
<td></td>
<td>(1.00)</td>
<td>(-2.36)</td>
</tr>
<tr>
<td>Living with adult children vs. Living alone (ref.)</td>
<td>0.056**</td>
<td>-0.048</td>
</tr>
<tr>
<td></td>
<td>(2.02)</td>
<td>(-1.02)</td>
</tr>
<tr>
<td>Living with spouse and adult children vs. Living alone (ref.)</td>
<td>0.090**</td>
<td>-0.098**</td>
</tr>
<tr>
<td></td>
<td>(2.42)</td>
<td>(-2.04)</td>
</tr>
<tr>
<td>Living with adult children vs. Living with spouse and adult children (ref.)</td>
<td>-0.034</td>
<td>0.050**</td>
</tr>
<tr>
<td></td>
<td>(-1.62)</td>
<td>(2.16)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.025</td>
<td>-0.018</td>
</tr>
<tr>
<td></td>
<td>(-1.56)</td>
<td>(-0.97)</td>
</tr>
<tr>
<td>Age square</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(1.09)</td>
<td>(0.66)</td>
</tr>
</tbody>
</table>

**Education level (reference group: Illiterate)**

| Can read or write | 0.000 | -0.036 |
|                  | (0.02) | (-1.64) |
| Primary school   | -0.000 | -0.020 |
|                  | (-0.01) | (-0.88) |
| Secondary school or above | -0.111 | -0.075 |
|                  | (-1.42) | (-0.17) |

**Living arrangements preferences (reference group: Live with adult children)**

<p>| Live in the same community/village | 0.008 | -0.016 |
|                                   | (0.61) | (-0.87) |</p>
<table>
<thead>
<tr>
<th>Category</th>
<th>B (SE)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neither in the same house nor the same community/village</td>
<td>0.015 (0.45)</td>
<td>0.15</td>
</tr>
<tr>
<td>Live in a nursing house</td>
<td>0.134 (3.04)</td>
<td>0.004</td>
</tr>
<tr>
<td>Other</td>
<td>-0.085 (-1.27)</td>
<td>0.28</td>
</tr>
<tr>
<td><strong>Financial support from non-coreresident adult children (reference group: No)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-0.022 (-1.68)</td>
<td>0.018</td>
</tr>
<tr>
<td><strong>Instrument support from non-coreresident adult children (reference group: No)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-0.051 (-2.98)</td>
<td>0.035</td>
</tr>
<tr>
<td><strong>Emotion support from non-coreresident adult children (reference group: No)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.017 (0.85)</td>
<td>-0.101</td>
</tr>
<tr>
<td><strong>Numbers of adult household members</strong></td>
<td>-0.029 (-4.15)</td>
<td>-0.008</td>
</tr>
<tr>
<td><strong>Numbers of grandchildren in the households</strong></td>
<td>0.024 (2.92)</td>
<td>0.012</td>
</tr>
<tr>
<td><strong>Numbers of adult children live nearby</strong></td>
<td>-0.007 (-1.77)</td>
<td>0.011</td>
</tr>
<tr>
<td><strong>Total household income level (reference group: Bottom quintile)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second lowest quintile</td>
<td>0.032 (1.76)</td>
<td>-0.029</td>
</tr>
<tr>
<td>Middle quintile</td>
<td>0.008 (0.39)</td>
<td>-0.035</td>
</tr>
<tr>
<td>Second highest quintile</td>
<td>-0.034 (-1.50)</td>
<td>-0.103</td>
</tr>
<tr>
<td>Top quintile</td>
<td>-0.049 (-2.12)</td>
<td>-0.094</td>
</tr>
<tr>
<td>Missing</td>
<td>0.023 (0.39)</td>
<td>-0.114</td>
</tr>
<tr>
<td></td>
<td>(1.08)</td>
<td>(-3.64)</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>Constant</td>
<td>1.586***</td>
<td>1.249*</td>
</tr>
<tr>
<td></td>
<td>(2.82)</td>
<td>(1.87)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,956</td>
<td>1,341</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.124</td>
<td>0.127</td>
</tr>
<tr>
<td>Number of individuals</td>
<td>1,954</td>
<td>1,494</td>
</tr>
</tbody>
</table>

1. Robust z-statistics in parentheses
2. *** p<0.01, ** p<0.05, * p<0.1

Source: Authors’ own computation

6.4 Sensitivity checks

The use of household-level indicators of economic well-being to measure the economic well-being of women aged 60 years and over has been used frequently in many previous studies, as discussed in section 2.3.3. However, this use of household-level indicators that respond to economic well-being to measure women’s economic well-being is not desirable. This is because resources are not necessarily equally distributed within households. Therefore, using household-level indicators to represent individual-level indicators for women may overestimate the level of women’s economic well-being. A discussion based on this point is detailed in section 2.3.3. In addition, income-related variables often have a large number of missing values and therefore a large number of samples are lost when used in analysis, which may affect the accuracy of the model estimates. Although the imputation technique can be used to deal with these missing values, this technique is still based on the estimation of other data in the sample that do not have missing values, and therefore do not fully address the issue of model prediction accuracy. Both of these issues are also encountered in this sensitivity check for the household-level measures of economic well-being below.

The household-level measures of economic well-being I used is the per capita
household income, in line with the Liu (2018) and Yang (2018) studies. Like the two studies mentioned above, I also use the national poverty line to measure the economic poverty of women aged 60 and over. The per capita household income in urban areas is also price-indexed to ensure that urban areas are comparable with rural areas. Table 6-5 shows the distribution of the variable per capita household income. The table shows that there are significant missing values for this variable in both urban and rural areas (18.7% in rural areas and 22% in urban areas).

Table 6-5 Distribution of household income per capita

<table>
<thead>
<tr>
<th>Variable</th>
<th>Place of residence</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
<th>Percent Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per capital household</td>
<td>Rural</td>
<td>1,773</td>
<td>4,138</td>
<td>7,386</td>
<td>-7,650</td>
<td>114,000</td>
<td>18.7</td>
</tr>
<tr>
<td>income</td>
<td>Urban</td>
<td>1,194</td>
<td>11,714</td>
<td>15,745</td>
<td>-71,200</td>
<td>295,082</td>
<td>22.0</td>
</tr>
</tbody>
</table>

Source: Authors’ own computation based CHARLS 2011.

In addition, Table 6-6 reflects the deprivation of economic well-being of women aged 60 and over in China, using different measures of economic well-being. It is evident that the proportion of women who are economically deprived is much lower in both urban and rural areas when using the national poverty line measurement than the proportion of women aged 60 and over who are economically deprived when using the constructed economic well-being in this chapter. This suggests that using a household-level measure would underestimate the economic well-being deprivation of these women.

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38 There is a discussion of these two studies in section 2.3.3.2.

39 The current national poverty line is generally based on the 2011 rural poverty line: an annual per capita income of ¥2,300 (£221) (based on 2011 exchange rates: ¥1=£0.09646).

40 This construct of economic well-being encompasses both subjective and objective measures of economic well-being, and can reflect the impact of household economic well-being on the economic well-being of individuals. This is described in sections 2.3.3.1, 2.3.3.2 and 2.3.3.3.
Table 6-6 The deprivation of economic well-being of women aged 60 and over in China by using different measures of economic well-being (Weighted)

<table>
<thead>
<tr>
<th>Measures of economic well-being</th>
<th>Rural</th>
<th></th>
<th>Urban</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not deprived</td>
<td>Deprived</td>
<td>Not deprived</td>
<td>Deprived</td>
</tr>
<tr>
<td>Per capital household income</td>
<td>23.30</td>
<td>76.70</td>
<td>16.81</td>
<td>83.19</td>
</tr>
<tr>
<td>Constructed economic well-being</td>
<td>39.35</td>
<td>60.65</td>
<td>33.59</td>
<td>51.55</td>
</tr>
</tbody>
</table>

Source: Author’s calculations using the CHARLS wave 1 (2011)

In addition, Table 6-7 show that when using living arrangements to predict economic deprivation using the per capita household income approach, there is no relationship between living arrangements and economic well-being for women aged 60 and over, whether in urban or rural areas. However, the number of adult household members significantly reduces the likelihood of economic deprivation for women aged 60 and over, while the number of grandchildren in the household significantly increases the likelihood of economic deprivation for women aged 60 and over. Other variables related to household income, such as the number of adult children living nearby and access to financial support from non-coresident adult children, also reduce the economic deprivation of these women. It is clear from these findings that economic well-being constructed using per capita household income actually reflects the economic well-being of households, and therefore variables that have an impact on the household income are naturally found to have a significant effect in the model. However, constructing economic well-being in this way does not reflect the true picture of the economic well-being of individuals within a household. Therefore, we should not use these household-level indicators to measure the economic well-being of individuals in our analysis.

Table 6-7 The relationship between living arrangements and economic well-being constructed using per capita household income

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living alone vs Living with spouse (ref.)</td>
<td>1.415</td>
<td>3.614</td>
</tr>
<tr>
<td>Comparison</td>
<td>OR</td>
<td>SE</td>
</tr>
<tr>
<td>------------</td>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td>Living with children vs Living with spouse (ref.)</td>
<td>0.464</td>
<td>0.850</td>
</tr>
<tr>
<td></td>
<td>(-1.02)</td>
<td>(-0.42)</td>
</tr>
<tr>
<td>Living with spouse and children vs Living with spouse (ref.)</td>
<td>0.511</td>
<td>0.543</td>
</tr>
<tr>
<td></td>
<td>(-1.83)</td>
<td>(-1.54)</td>
</tr>
<tr>
<td>Living with children vs Living alone (ref.)</td>
<td>0.328</td>
<td>0.235</td>
</tr>
<tr>
<td></td>
<td>(-1.89)</td>
<td>(-1.34)</td>
</tr>
<tr>
<td>Living with spouse and children vs Living alone (ref.)</td>
<td>0.361</td>
<td>0.150</td>
</tr>
<tr>
<td></td>
<td>(-2.51)</td>
<td>(-3.02)</td>
</tr>
<tr>
<td>Living with children vs Living with spouse and children (ref.)</td>
<td>0.907</td>
<td>1.564</td>
</tr>
<tr>
<td></td>
<td>(-0.50)</td>
<td>(1.39)</td>
</tr>
<tr>
<td>Age</td>
<td>1.497***</td>
<td>0.641***</td>
</tr>
<tr>
<td></td>
<td>(2.85)</td>
<td>(-2.69)</td>
</tr>
<tr>
<td>Age square</td>
<td>0.997***</td>
<td>1.003**</td>
</tr>
<tr>
<td></td>
<td>(-2.67)</td>
<td>(2.51)</td>
</tr>
<tr>
<td>Education level (reference group: Illiterate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can read or write</td>
<td>0.975</td>
<td>0.620*</td>
</tr>
<tr>
<td></td>
<td>(-0.17)</td>
<td>(-1.84)</td>
</tr>
<tr>
<td>Primary school</td>
<td>0.798</td>
<td>0.416***</td>
</tr>
<tr>
<td></td>
<td>(-1.37)</td>
<td>(-4.10)</td>
</tr>
<tr>
<td>Secondary school or above</td>
<td>0.752</td>
<td>0.138***</td>
</tr>
<tr>
<td></td>
<td>(-1.02)</td>
<td>(-6.32)</td>
</tr>
<tr>
<td>Living arrangements preferences (reference group: Live with adult children)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live in the same community/village</td>
<td>0.893</td>
<td>0.711*</td>
</tr>
<tr>
<td></td>
<td>(-0.93)</td>
<td>(-1.82)</td>
</tr>
<tr>
<td>Neither in the same house nor the same community/village</td>
<td>0.849</td>
<td>0.916</td>
</tr>
<tr>
<td></td>
<td>(-0.61)</td>
<td>(-0.24)</td>
</tr>
<tr>
<td>Live in a nursing house</td>
<td>0.668</td>
<td>0.647</td>
</tr>
<tr>
<td></td>
<td>(-1.06)</td>
<td>(-0.96)</td>
</tr>
</tbody>
</table>
I used individual cross-sectional weights with non-response adjustment in the analysis (see the discussion of this weight in section 3.3.3). Thus, I also did a sensitivity check on this weight. Table A6-1-1 (see Appendix A6-1) reflect the results without the inclusion of this weight. After comparing the results without the weight with the results with the weight, it was found that the predicted results of the
variables in the model did not change significantly after the inclusion of this weight. It is important to note that while some variables became weaker or stronger in their effect on economic well-being, such as the living arrangements and living arrangements preferences. However, no change from insignificant to significant or vice versa was found. And the direction of the relationship between these significant results and economic well-being did not change either. Therefore, it can be said that my regression results are robust and insightful.

6.5 Discussion

The purpose of this chapter is to explore the relationship between the living arrangements of women aged 60 and over and their level of economic well-being. Unlike Chapter 5, which used only objective measures to explore economic well-being, this chapter also includes subjective measures of economic well-being. After incorporating consideration of the subjective dimension of economic well-being, my study shows that there are urban-rural differences in the impact of living arrangements on older women’s economic well-being. In rural areas, the economic well-being of women aged 60 and over living alone is better than that of women aged 60 and over living in the other types of living arrangements. In contrast, in urban areas, the economic well-being of women aged 60 and over living with their spouse and adult children is better than that of women aged 60 and over living in the other types of living arrangements.

Findings based on rural women aged 60 and over differ from previous studies that concluded that spouses are the main supporters of these women and have an positive impact on these women’s economic well-being (Gruijters, 2017; Nygård et al., 2017; Shen et al., 2013) and that not living with children harms these women’s economic well-being (Chan et al., 2002; Chen, 2016; Mutchler et al., 2019; Sun, 2002). One possible explanation is that in rural areas, rural women aged 60 and over, may be their main supporter. In Jacka’s 2014 and Huang’s 2018 studies, it was found
that rural women aged 60 and over are not necessarily disadvantaged. These women are active and capable workers who make significant contributions to their family.

Another possible explanation is that adult children living nearby may be their main financial supporters. For women aged 60 and over, living with adult children in close proximity has a more positive impact on their economic well-being than living with adult children would have on their economic well-being. Previous research has found that living with adult children is associated with a higher probability of receiving support from family members (Do & Malhotra, 2012; Russell, 2009). However, women aged 60 and over may experience conflict with their adult children and may have additional family responsibilities such as caring for grandchildren (Deng et al., 2016; Wenger et al., 2007). Therefore, the potential conflict and stress of rural women aged 60 and over living with their adult children may result in lower levels of economic well-being than those of rural women aged 60 and over with adult children living nearby. These women aged 60 and over who live with adult children have less intergenerational conflict, and also have the support of adult children living nearby. As a result, their economic well-being is better than that of women aged 60 and over living with their adult children. This is also reflected in my analysis, where I find that the number of adult children living nearby and the support they give to these women significantly reduces their deprivation of economic well-being. I also found that any increase in the number of grandchildren in the household increases the deprivation of these women’s economic well-being.

However, in urban areas, living arrangements with spouses and adult children had a positive effect on the economic well-being of women aged 60 and over, while other types of living arrangements had no effect on these women’s economic well-being. This finding is in line with previous studies that have found that urban women aged 60 and over living with a spouse are less likely to report their economic well-being as poor (Gruijters, 2017; Nygård et al., 2017; Shen et al., 2013) and with studies that
have found that not living with children harms the economic well-being of women aged 60 and over (A. Chan et al., 2002; X. Chen, 2016; Mutchler et al., 2019; Sun, 2002).

Also, the findings of this chapter are different from those in Chapter 5 on economic well-being. In Chapter 5, I found that for rural women aged 60 and over, spouses and adult children play a negative role in their economic well-being. However, this effect is not very robust and is only significant at the 0.1 level. For urban women aged 60 and over, spouses and adult children have no effect on their economic well-being. In this chapter, when I add subjective measures of economic well-being, I find that for rural women aged 60 and over, the role of spouse and adult children on their economic well-being is also negative, while for urban women, the opposite is true. Urban women aged 60 and over who live with their spouse and adult children have somewhat better economic well-being than women in the other living arrangements. The differentiation between the urban and rural findings in this chapter and the differentiation between the findings in Chapter 5 and this chapter seem to point to the possibility that this difference in findings may be due to an unequal distribution of resources within households.

Much empirical evidence suggests that the distribution of resources within households does not conform to the assumption of 'equal sharing', but rather depends on bargaining power (e.g. Alderman et al., 1995; Aronsson et al., 2001; Browning & Chiappori, 1998; Espinoza-Delgado & Klasen, 2018). Thus, when women's contributions to the household are of lower value, they tend to have less bargaining power and therefore only receive a smaller share of resource allocation, which in turn reduces their economic well-being (see Agarwal, 1997; Arber, 2006; Doss, 2006; Duflo, 2003; Espinoza-Delgado & Klasen, 2018; Price, 2003; Quisumbing & Maluccio, 2003; Vijaya et al., 2014; Zaidi, 2010). Combined with this point, for rural women, the value of their contribution to the household may be low due to
inadequate social benefits and income, and therefore their bargaining power within the household is limited. When they live with other household members, they may be allocated fewer resources due to their lower bargaining power, and therefore may have a lower level of economic well-being than other household members. Thus, my findings show that rural women aged 60 and over living alone have better economic well-being than rural women aged 60 and over in other types of living arrangements.

For urban women, on the other hand, their social benefits and income are higher than those of rural women (see the discussion of the differences in social benefits and income between rural and urban women in section 1.2). Their contribution to the household may be of relatively greater value than rural women and they may have access to about the same resources within the household as other household members. Thus, when they live with spouses and adult children, the economic uplift of the household as a whole has a greater impact on their economic well-being.

The impact of bargaining power on the economic well-being of women aged 60 and over was not captured in Chapter 5, which may be due to measurement error in the objective measures of economic well-being used in this thesis (see the detailed discussion in section 4.3.2). The impact of bargaining power on the economic well-being of these women is captured more strongly with the inclusion of subjective measures of economic well-being in the analysis in this chapter. Therefore, in order to gain a more comprehensive understanding of the relationship between the resource’s allocation within households and the economic well-being of women aged 60 and over in China, I use subjective measures of economic well-being to examine this issue later in Chapter 7.

The above findings should be viewed in the context of several limitations. Firstly, the subjective assessment of respondents' economic well-being only appeared in the
CHALRS baseline questionnaire. The analysis in this chapter is therefore based on cross-sectional data, which cannot account for changes in economic well-being and living arrangements over time.

In addition, the consideration of selection issues is a limitation that needs to be noted. In Chapter 5, it is mentioned that there is substantial evidence that older parents move to their children's homes due to financial problems (Deng et al., 2019; Lei et al., 2012a). Therefore, this issue also needs to be taken into account when interpreting the findings of this chapter. For example, in rural areas, there are also women who choose to live with other family members because they have financial difficulties. Therefore, in the analysis, women who live alone are found to have better economic well-being than women in other types of living arrangements. So, in interpreting the findings we cannot be sure of the causal relationship.

I was unable to control for certain potentially confounding variables, such as personality characteristics of women aged 60 and over, as these were not measured in CHARLS. In addition, this chapter focuses only on living arrangements with adult children and spouses. Future research may want to consider the impact of living arrangements with other family members and friends. Finally, although geographical differences between urban and rural areas were considered, sample size limitations did not allow for the study of differences between provinces. Future research could explore any differences between provinces.

Despite these limitations, this chapter still makes an empirical and methodological contribution to the existing literature. First, explores the relationship between the living arrangements of women aged 60 and over and their economic well-being in China through the CHARLS dataset. It also compares the impact of different living arrangements on the economic well-being of women aged 60 and over. As such, it contributes to the literature on the economic well-being of women aged 60 and over.
and to the discussion on the relationship between the living arrangements of women aged 60 and over and their economic well-being in China. Second, it uses constructed economic well-being to reflect individual economic well-being under the influence of household economic well-being, unlike previous studies that have used household economic well-being to measure the individual economic well-being of women aged 60 and over. This measure is a more realistic reflection of the economic well-being of these women. This provides researchers with a new way of thinking about measuring the economic well-being of women aged 60 and over in related studies.
Chapter 7 Share of household income and subjective economic well-being of women aged 60 and over in multigenerational households

7.1 Introduction

In Chapter 5, the impact of spouses and adult children on the economic well-being of rural women aged 60 and over is negative, while there is no impact on the economic well-being of urban women aged 60 and over. Meanwhile, the economic well-being of adult children and women aged 60 and over was found to be unrelated in both rural and urban areas. In contrast, in Chapter 6, when subjective measures of economic well-being were added to the measure of economic well-being, it was found that the effect of spouses and adult children on economic well-being was also likely to be negative for rural women aged 60 and over, but the opposite for urban women. Urban women aged 60 and over who live with their spouses and adult children have better economic well-being than women in any other living arrangements. A point made in the discussion section of Chapter 6 on the differences found between the two chapters is that this phenomenon may be due to the fact that the distribution of resources within households may not be equal. The reason this effect is not fully captured in Chapter 5 may be due to measurement error in the objective measures of economic well-being used in this thesis (see section 4.3.2 for a detailed discussion of measurement error in this variable). This was discovered when subjective measures of economic well-being were added to the analysis in Chapter 6. Therefore, in order to capture the true impact of intra-household economic resource allocation on the economic well-being of women aged 60 and over in China, I turn my attention to subjective economic well-being in the analysis in this chapter.
There is no agreement on the results of current research on the impact of household resource allocation on individuals' subjective well-being. Scholars who support the power resource allocation theory argue that when wives’ share of household income increases, they are more likely to report higher levels of subjective economic well-being than their husbands (e.g., Bonke & Browning, 2009; Eirich & Robinson, 2017; Tisch, 2021). Other scholars who support the unitary household assumptions argue that the most important factor influencing individual subjective economic well-being is not the individual’s share of household income but the total income of the household (e.g., Rojas, 2005, 2007; Molina, Navarro & García, 2007; Sayer et al., 2011). Subsequently, some researchers who emphasise gender ideology point out that in households that believe in the ‘male breadwinner’ as a gender role, an increase in wives’ share of household income leads to a decrease in their own and their spouses’ subjective economic well-being level because it goes against their beliefs (e.g., Menaghan, 1991; Tichenor, 1999; Sonnenberg, Burgoyne & Routh, 2011; Kan and Laurie, 2014).

In addition, much of the current research on this topic has focussed on coupled households41, and there is a lack of research on multigenerational households42. Such research is important, as women aged 60 and over may not be the main income earners in their households (see the discussion of this point in section 1.2) when they live with their adult children. So, we should ask: How satisfied are they with their economic well-being? Are they affected by their reduced share of household income? At present, the answer is not clear. This chapter therefore focuses on the relationship between women aged 60 and over’s share of household income and their subjective economic well-being. It also investigates different living arrangements, including couple households and multigenerational households.

41 Here, the term ‘coupled households’ refers to households containing married couples who live together.
42 Here, the term ‘multigenerational households’ refers to households including a variety of family members, such as adult children, grandchildren, relatives and/or parents.
Based on the above discussion, the following research questions are addressed:

**R1:** Are women aged 60 and over's shares of household income associated with their subjective economic well-being across living arrangements?

**R2:** If a relationship exists, what is the relationship?

**R3:** Are there urban–rural differences in the relationship?

To minimise the impact of heterogeneity across households and obtain more accurate estimates, an analysis of the subjective economic well-being of women aged 60 and over’s spouses is also included in this chapter, for which the research question is:

**R4:** Is there a correlation between women aged 60 and over's share of household income and their spouse's subjective economic well-being across living arrangements?

In the next section (**section 7.2**), I review the theoretical background relevant to the relationship between women aged 60 and over's share of household income and subjective economic well-being and generate my research hypotheses based on the associated theories. In **section 7.3**, I consider how the sample and variables were constructed and outline the analytical strategy. **Section 7.4** presents the main descriptive statistics and the estimation models used to predict women aged 60 and over’s subjective economic well-being, as well as the empirical results. I used individual cross-sectional weights with non-response adjustment in the analysis due to the high number of missing values for the dependent variable used in this chapter. Sensitivity checks on this weight are described in **section 7.5**. Finally, I conclude with a discussion of the chapter's findings in **section 7.6**.

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43 This is because this chapter is a chapter that derives from the differences in the conclusions of Chapters 5 and 6. The literature review in **section 1.3** therefore does not discuss studies on this topic. Therefore, the discussion of the literature on the relevant topic is carried out here.
7.2 Theoretical background and hypotheses

7.2.1 Subjective economic well-being and intra-household resources allocation

The unitary household model provides an explanation of the relationship between intra-household resources allocation and subjective economic well-being within the household. In particular, it assumes that all resources in the household are pooled, that all members share these resources equally and that the subjective economic well-being level of each member is equal to that of the other members (Becker, 1981). Thus, the relationship between a husband and wife within a household may be cooperative rather than competitive, and they may only consider their total income when evaluating their economic status (Eirich & Robinson, 2017). These conjectures are corroborated by studies undertaken by several scholars that suggest individual economic satisfaction is positively associated with an increase in a household's total income, independent of individual income (Molina et al., 2007; Rojas, 2005, 2007).

At the same time, other researchers have challenged this view based on the resource theory of power. Generally, it has been found that resources within households are not necessarily equally distributed. For example, even for individuals living in wealthy households, their economic status may not coincide with that of the household (Agarwal, 1997; Doss, 2006b; Duflo, 2003b; Espinoza-Delgado & Klasen, 2018; Quisumbing & Maluccio, 2003b; Vijaya et al., 2014). At the same time, an increase in the relative income of an individual can increase their economic satisfaction (Blood & Wolfe, 1960; McElroy & Horney, 1981; Tisch, 2021). The fact that individuals with high economic attributes within a household can ensure that their preferences are fully taken into account when making household decisions (Eirich & Robinson, 2017; Lundberg et al., 1997; Sayer et al., 2011) has a positive impact on their subjective economic well-being (Blood & Wolfe, 1960; Kulic et al.,
Under such a framework, wives having a higher relative income or greater human capital could have a better bargaining position within the household, which would in turn increase their level of subjective economic well-being (Eirich & Robinson, 2017; Kulic et al., 2020).

7.2.2 Subjective economic well-being and gender ideology

However, the literature has also found that gender ideology influences how satisfied individuals are with their economic status. In particular, researchers have found that the traditional ideological concept of males as breadwinners has a significant impact on couples' economic satisfaction. Husbands who prefer traditional gender roles tend to be less satisfied with their economic status when a greater share of the household income is brought in by the wife (Hajdu & Hajdu, 2018). This may be due to the fact that couples who follow traditional gender ideology prefer men to have more wealth than their female partners, emphasising the male breadwinner role (Kulic et al., 2020). Women may also be less financially satisfied if they have more wealth than their partner due to internalised ideology or social circumstances (Tisch, 2021).

Thus, women may voluntarily limit their power in decision-making in order to maintain the gender role balance between couples (Sonnenberg et al., 2011; Tichenor, 1999; West & Zimmerman, 1987). At the same time, a woman with more wealth than her male partner may also pose a threat to the traditional masculinity of the male partner, whose self-esteem may decline, leading to a decrease in his economic satisfaction (Kan & Laurie, 2014; Menaghan, 1991). The male may therefore compensate for his perceived loss of masculinity by reverting to a more traditional division of domestic roles through the act of ‘doing gender’ (gender display theory; West & Zimmerman, 1987).

7.2.3 Subjective economic well-being and filial piety culture

Based on the above discussion, it seems reasonable to assume that women aged 60
and over’s economic satisfaction increases when their share of household income increases (based on the resource theory of power) and that their spouses’ economic satisfaction decreases (based on traditional gender ideology). However, as many women aged 60 and over also live in multi-generational households, the situation may be slightly different, and the above assumptions cannot be made directly. When analysing the relationship between women aged 60 and over’s share of household income and their economic satisfaction in China, the influence of filial culture should also be taken into account. The Chinese culture of filial piety is rich in connotations, encompassing support for parents, succession to the family business, the continuation of adult children for the family and funeral rituals, and a whole set of culture is built around familialism (Liu, 2012). Filial piety is generally divided into authoritative filial piety and reciprocal filial piety, both of which have their own connotations and operational functions. In particular, reciprocal filial piety emphasises the equality and reciprocity of parent–child relationships based on kinship, whereas authoritative filial piety emphasises role and status norms and the suppression of hierarchical relationships between adult children and their older parents (Li, 2020).

With the rise of individualism in recent years, some scholars have observed a gradual weakening of filial culture. But there is no denying that it is still influential. Some scholars have found that in households in which older people live with their adult children, the reciprocity of filial culture is still present, with adult children providing support to and honouring their parents (e.g., Huai, 2001, p. 20; Lei et al., 2015; Qu, 2015; Fan, Fang & Yang, 2018). In part, this implies that in households with adult children who follow the traditions of filial culture, the pattern of resource allocation may be more in line with the assumptions of the unitary household model, with members of the household sharing resources equally. In such cases, the share of household income of women aged 60 and over might not affect their subjective economic well-being. However, if adult children do not follow the traditions of filial
culture, the pattern of resource allocation in the household may be more in line with the assumptions of the resource theory of power, according to which women aged 60 and over’s economic satisfaction would increase when their share of household income increases.

Based on the above discussion, several hypotheses were formulated as follows:

1. **For women aged 60 and over living with their spouse (coupled households)**

   **Hypothesis 1:** The higher a woman’s share of household income, the lower her subjective economic well-being (based on traditional gender roles).

   **Hypothesis 2:** The higher a woman's share of household income, the lower her spouse's subjective economic well-being (based on traditional gender roles).

2. **For women aged 60 and over who live with their adult children/live with their spouse and adult children (multi-generational households)**

   **Hypothesis 3:** There is no relationship between a woman’s share of household income and her subjective economic well-being; instead, her subjective economic well-being is related to the total income of the household (based on filial cultural traditions and the unitary household model).

### 7.3 Methods

#### 7.3.1 Data and sample

This chapter used the China Health and Retirement Longitudinal Study (CHARLS) baseline questionnaire (CHARLS 2011) as independent cross-sectional data. The CHARLS baseline questionnaire asks respondents to provide personal information (such as socio-demographic characteristics and information on work and income, which are included in the individual section) and household information (such as household structure, information on household production and income and housing environment, which are included in the household section) for each household.
member, including the respondent, the respondent's partner and other household members. In addition, the questionnaire asked respondents and their spouses about their respective assessments of their current economic situation. Thus, the CHARLS baseline data contains the basic information needed for the analysis in this chapter. However, unfortunately the question asking for assessment of the respondents’ current economic situations was removed from subsequent CHARLS surveys, meaning this chapter cannot not use longitudinal analysis to investigate the dynamic relationship between the individual economic well-being of women aged 60 and over and their share of household income.

As the research in this chapter is centred on the impact of the share of household income of women aged 60 and over on their and their spouses’ subjective economic well-being when living in coupled households and multi-generational households, women aged 60 and over and their spouses who live in these types of households were chosen for the study. In the sample, women aged 60 and over living alone accounted for 13.58% of the total number of women aged 60 and over (see Table 7-1). Of the women aged 60 and over with a spouse, 0.4% of the sample of women aged 60 and over (see Table 7-1) who cohabitated with their partner were also excluded from the sample used for analysis. Theoretically, it would be valuable to compare the similarities and differences between married and cohabiting (but not married) couples in terms of the impact of women aged 60 and over’s share of household incomes on their own and their spouses' subjective economic well-being. However, information on the partners of such respondents was not included in the CHARLS questionnaire, and the sample size of cohabiting women aged 60 and over was too small to be covered in the analysis. In addition, the CHARLS questionnaire investigated the gender of the partner and thus allows for the identification of LGBT households. The inclusion of these types of households makes the analysis of great

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44 For a detailed description of this data please see section 3.3.1.
45 This type of family may be a cohabiting couple or a cohabiting couple with other family members.
interest, as it makes it possible to see how gender awareness affects the subjective economic well-being of women aged 60 and over in these households. However, due to the limitations of the small sample size (LGBT women represented only 0.03% of the total sample of women aged 60 and over; see Table 7-1), LGBT women could not be included in the analysis. My final sample contained information on 3,190 women aged 60 and over, 1,890 of whom lived in rural areas and 1,300 of whom lived in urban areas.

Table 7-1 Different categories of women aged 60 and over who were excluded from the sample

<table>
<thead>
<tr>
<th>Category</th>
<th>Freq.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living alone</td>
<td>505</td>
<td>13.58</td>
</tr>
<tr>
<td>Cohabitating</td>
<td>15</td>
<td>0.4</td>
</tr>
<tr>
<td>LGBT</td>
<td>11</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Notes: N = 3,719
Source: Authors’ estimates based on data from CHARLS wave 1.

7.3.2 Dependent variables

The dependent variable used in the analysis is subjective economic well-being, which was discussed in detail in section 4.3.2. This is an ordered discrete variable that measures how individuals rate their current economic well-being. The ratings were categorised into five levels: ‘very high’, ‘relatively high’, ‘average’, ‘relatively poor’ and ‘poor’. To be consistent with the operationalisation of well-being in this study (which actually measures ill-being in this thesis, see section 4.2.2.4 for a discussion of the reasons for applying this operationalisation) to facilitate comparison of findings, subjective economic well-being was recoded as a dichotomous variable, i.e., 1 = deprived, 0 = not deprived.

In the analysis, I also consider whether the subjective economic well-being of
women aged 60 and over’s spouses is affected by women aged 60 and over’s share of household income. Therefore, the dependent variable in this chapter includes both the subjective economic well-being of women aged 60 and over and that of their spouses.

**Table 7-2** presents the sample distribution of the subjective economic well-being for women aged 60 and over and their spouses in urban and rural areas. As can be seen from the table, gender differences are quite pronounced, with women aged 60 and over tending to have lower levels of subjective economic well-being than their spouses. 34.95% of the sample of women aged 60 and over reported their level of subjective economic well-being as deprived, while the number of spouses who reported their level of subjective economic well-being as deprived was 33.48% in urban areas. Meanwhile, 42.46% of rural women aged 60 and over reported their level of subjective economic well-being as deprived while only 39.97% of spouses reported their level of subjective economic well-being as deprived.

**Table 7-2 Sample distribution of subjective economic well-being (weighted)**

<table>
<thead>
<tr>
<th></th>
<th>Urban Spouses</th>
<th>Urban Women</th>
<th>Rural Spouses</th>
<th>Rural Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not deprived</td>
<td>58.15%</td>
<td>57.35%</td>
<td>53.81%</td>
<td>49.68%</td>
</tr>
<tr>
<td>Deprived</td>
<td>33.48%</td>
<td>34.95%</td>
<td>39.97%</td>
<td>42.46%</td>
</tr>
<tr>
<td>Missing</td>
<td>8.34%</td>
<td>7.71%</td>
<td>6.21%</td>
<td>7.86%</td>
</tr>
<tr>
<td>N</td>
<td>1,300</td>
<td>1,300</td>
<td>1,890</td>
<td>1,890</td>
</tr>
</tbody>
</table>

*Source: Author’s calculations using the CHARLS Baseline (2011) sample.*

In addition, within rural households, 14.3% of women aged 60 and over reported higher levels of subjective economic well-being than their partners, while 16.4% reported the opposite (**Table 7-3**). In urban areas, 13.5% of women aged 60 and over reported being better off financially than their spouses, with the remaining 10.9% reporting the opposite (**Table 7-3**). In addition, the percentage of couples in rural
areas reporting the same level of subjective economic well-being (56.7%) was lower than that in urban areas (60.8%). This may indicate that gender differences regarding subjective economic well-being may be more pronounced in rural areas compared to urban areas.

Table 7-3 Gender differences and subjective economic well-being in coupled households (weighted)

<table>
<thead>
<tr>
<th></th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher subjective economic well-being level than spouse</td>
<td>13.5%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Equal level of subjective economic well-being</td>
<td>60.8%</td>
<td>56.7%</td>
</tr>
<tr>
<td>Lower subjective economic well-being level than spouse</td>
<td>10.9%</td>
<td>16.4%</td>
</tr>
<tr>
<td>Missing</td>
<td>14.8%</td>
<td>12.7%</td>
</tr>
<tr>
<td>N</td>
<td>1,300</td>
<td>1,890</td>
</tr>
</tbody>
</table>

Source: Author’s calculations using the CHARLS Baseline (2011) sample.

It is also important to note that the sample had a large number of missing values. This phenomenon is addressed in section 4.3.2, where it is suggested that it may be due to the fact that people with high levels of economic well-being are more likely to refuse to answer income-related questions (Zhong et al., 2014) and that groups with high or very high levels of economic well-being may be underrepresented in the sample. Thus, in this analysis, treatments were used to mitigate the bias in sample estimates due to this issue, mainly by adding weights adjusted for non-responses from individuals who were underrepresented in the group. It is still important to emphasise here that although these treatments can to some extent compensate for the group representation problem, they do not completely eliminate the effect. The sensitivity of the weights is also checked in section 7.5.
7.3.3 The independent variable

Women aged 60 and over’s share of household income is the key independent variable in this chapter. In some studies, it has been found that people may be influenced by the manner in which they receive their money (Frey et al., 2004). Generally, labour income is a stronger predictor of an individual’s economic well-being than non-labour income (Ahn et al., 2014). Therefore, in my study, I use women aged 60 and over’s individual labour income to construct their share of household income. Labour income includes pensions and income from work. Since some women aged 60 and over are engaged in productive activities that are shared within the household, such as self-employment or family farming, I calculated women aged 60 and over’s individual income by dividing the net profit of the joint household productive activity by the number of people in the household involved in the productive activity to obtain women aged 60 and over's per capita income from productive activity.

It should be noted here that in calculating the share of household income of women aged 60 and over, previous studies have often used a woman's labour income divided by the sum of her labour income and her spouse's labour income, as follows: 

Equation 7-1 The share of household income of women

\[
\text{Relative share of household income of woman} = \frac{\text{wife's labour income}}{\text{husband's labour income} + \text{wife's labour income}} \times 100
\]

However, applying this formula to multigenerational households is problematic. In particular, if a household contains one woman along with her spouse as well as their adult children, the use of this type of formula ignores the adult children’s contribution. Thus, in order to include the contributions of all household members, the other household members’ labour income needs to be added. When calculating an individual's share of household income, comparing one person's labour income with the other household members' total labour income is not reasonable. Instead, a
weighting needs to be used in the analysis. In order to make the comparison fairer, the other household members’ total labour income is divided equally (only among adult household members), and this divided labour income is compared with women aged 60 and over’s labour income:

Equation 7-2 Divided labour income

\[
\text{Divided labour income} = \frac{\text{other household members' total labour income}}{n - 1}
\]

The \( n \) here represents adult household members other than women aged 60 and over. A woman aged 60 and over’s relative share of household income can then be represented as follows:

Equation 7-3 A woman aged 60 and over’s relative share of household income

\[
\text{Relative share of household income of woman aged 60 and over} = \frac{\text{woman aged 60 and over’s labour income}}{\text{divided labour income + woman aged 60 and over’s labour income}} \times 100
\]

The share of household income of women aged 60 and over is here presented as a percentage.

7.3.4 Control variables

As this chapter is still concerned with economic well-being, the variables in Chapter 6 that have an impact on economic well-being and need to be controlled for are also added to the model in this chapter as control variables. And the operationalisation of these variables is consistent with Chapter 6. See Table 7-4 and Table 7-5 for details of these variables.

7.3.5 Missing data

As independent variables do not have many missing values (see Table 7-4 and Table 7-5), I applied casewise/listwise deletion to exclude them from the regression analysis. However, in the previous section, it was mentioned that the dependent

\[46\] Young children are often not involved in bargaining within the family (Gou, 2015).
variable had many missing values. Similar to Chapter 6, individual cross-sectional weights with non-response adjustment were here used in the analysis to maintain the representativeness of Chinese women aged 60 and over as a whole after excluding the missing observations. However, it should be noted that the use of weights does not fully address the issue of bias due to missing values. The use of different imputation techniques to complement the missing data on the subjective economic well-being of women aged 60 and over could have been a better method to address this missing values. However, as discussed in Chapter 6, given the scope of the research and the limited time available to PhD students, these aspirations have been postponed for the time being and may be pursued during future postdoctoral research.

Table 7-4 Descriptive statistics for categorical variables for models predicting women aged 60 and over and their spouse’s subjective economic well-being (weighted)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Rural (N=1,890)</th>
<th>Urban (N=1,300)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>65.62</td>
<td>40.34</td>
</tr>
<tr>
<td>Can read or write</td>
<td>17.18</td>
<td>16.30</td>
</tr>
<tr>
<td>Primary school</td>
<td>14.03</td>
<td>16.72</td>
</tr>
<tr>
<td>Secondary school or above</td>
<td>3.13</td>
<td>26.04</td>
</tr>
<tr>
<td>Missing</td>
<td>0.04</td>
<td>0.60</td>
</tr>
<tr>
<td><strong>Financial support from non-residence adult children</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>45.06</td>
<td>58.19</td>
</tr>
<tr>
<td>Yes</td>
<td>54.35</td>
<td>40.70</td>
</tr>
<tr>
<td>Missing</td>
<td>0.59</td>
<td>1.11</td>
</tr>
<tr>
<td><strong>Instrument support from non-residence adult children</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>74.88</td>
<td>77.79</td>
</tr>
<tr>
<td>Yes</td>
<td>25.12</td>
<td>22.21</td>
</tr>
</tbody>
</table>
Emotion support from non-residence adult children

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>31.85</td>
<td>68.11</td>
</tr>
<tr>
<td>Missing</td>
<td>0.04</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Living arrangements preferences

<table>
<thead>
<tr>
<th></th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live with adult children</td>
<td>53.77</td>
<td>40.99</td>
</tr>
<tr>
<td>Live in the same community/village</td>
<td>33.37</td>
<td>42.27</td>
</tr>
<tr>
<td>Neither in the same house nor the same community/village</td>
<td>4.11</td>
<td>3.34</td>
</tr>
<tr>
<td>Live in a nursing house</td>
<td>1.6</td>
<td>2.39</td>
</tr>
<tr>
<td>Other</td>
<td>0.65</td>
<td>1.33</td>
</tr>
<tr>
<td>Missing</td>
<td>6.51</td>
<td>9.68</td>
</tr>
</tbody>
</table>

Source: Author’s calculations using the CHARLS wave 1 (2011)

Table 7-5 Descriptive statistics for continuous variables for models predicting women aged 60 and over and their spouse’s subjective economic well-being (weighted)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Place of residence</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
<th>Percent Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of household labour income</td>
<td>Rural</td>
<td>1,744</td>
<td>18%</td>
<td>31%</td>
<td>0%</td>
<td>100%</td>
<td>7.37</td>
</tr>
<tr>
<td>income</td>
<td>Urban</td>
<td>1,134</td>
<td>28%</td>
<td>33%</td>
<td>0%</td>
<td>100%</td>
<td>12.7</td>
</tr>
<tr>
<td>Age</td>
<td>Rural</td>
<td>1,886</td>
<td>68.99</td>
<td>7.80</td>
<td>60</td>
<td>99</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>1,294</td>
<td>69.00</td>
<td>7.75</td>
<td>60</td>
<td>101</td>
<td>0.46</td>
</tr>
<tr>
<td>Numbers of adult household members</td>
<td>Rural</td>
<td>1,890</td>
<td>3.27</td>
<td>1.49</td>
<td>1</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>1,300</td>
<td>3.13</td>
<td>1.40</td>
<td>1</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Numbers of grand adult children (households)</td>
<td>Rural</td>
<td>1,890</td>
<td>0.56</td>
<td>0.87</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>1,300</td>
<td>0.41</td>
<td>0.66</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Numbers of adult children living nearby</td>
<td>Rural</td>
<td>1,890</td>
<td>3.66</td>
<td>1.62</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>1,300</td>
<td>3.02</td>
<td>1.54</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Total household incomes</td>
<td>Rural</td>
<td>1,618</td>
<td>18,134.18</td>
<td>29,646.84</td>
<td>-15,300</td>
<td>259,270</td>
<td>15.02</td>
</tr>
</tbody>
</table>
7.3.6 Analytical statistics

As the dependent variable used in this chapter (women aged 60 and over's subjective economic well-being) was coded as a dummy variable, logistic regression models were applied in the analysis. In the first stage, the logistic regression model was used to examine the relationship between the share of household labour income of women aged 60 and over and their subjective economic well-being in different living arrangements (couple households and multigenerational households). In the second stage, the relationship between women aged 60 and over's share of household income and the subjective economic well-being of their spouses was also examined.

The following equations present two separate regression models: Model 1 predicts the effect of women aged 60 and over's share of labour household income on their subjective economic well-being, and Model 2 predicts the effect of women aged 60 and over's share of labour household income on the subjective economic well-being of their spouses. As the analysis in this chapter involved three types of living arrangements (living with adult children, living with spouse and living with adult children and spouse), separate logistic regression analyses were performed for each type of living arrangement. At the same time, as urban–rural differences are a research focus of this study, each model was also analysed separately for urban and rural samples of women aged 60 and over.

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47 See the discussion in section 4.4.3 for more information on the introduction of logistic regression models and how they were tested.
Equation 7-4 Model used for predicting the effect of women aged 60 and over’s share of household income on their subjective economic well-being

Model 1: \( \log \text{odds of being deprived} = \beta_0 + \beta_1 \times \text{women's share of household labour income} + \sum \beta_i x_{control \ variables \ of \ women \ aged \ 60 \ and \ over} \)

Equation 7-5 Model used for predicting the effect of women aged 60 and over’s share of household income on the subjective economic well-being of their spouses

Model 2: \( \log \text{odds of being deprived} = \beta_0 + \beta_1 \times \text{women's share of household labour income} + \sum \beta_i x_{control \ variables \ of \ spouses} \)

7.4 Results

7.4.1 Descriptive analysis

Tables 7-6 and 7-7 show the relationship between the mean of the household income shares of women aged 60 and over and their subjective economic well-being under different living arrangements and the subjective economic well-being of their spouses. Rural women aged 60 and over who report that their economic well-being is deprived have higher mean household income shares than women who report that their economic well-being is not deprived, with the opposite finding for urban areas. Also, in rural areas, the higher the mean household income share of women aged 60 and over, the more likely their spouses were to report that they were economically deprived, while this was not found in urban areas.

For women aged 60 and over living with adult children, there was no relationship between rural women’s share of household incomes and their subjective economic well-being. But the mean household income share of women aged 60 and over who reported that they were economically deprived was higher than the mean household income share of women who reported that they were not economically deprived in urban areas.

Among households living with a spouse and adult children, the same findings were
found in rural areas. However, in urban areas, the mean household income share of women aged 60 and over who reported that they were economically deprived was lower than the mean household income share of women who reported that they were not economically deprived. For spouses, the higher the mean of the household income shares of women aged 60 and over in both urban and rural areas, the more likely their spouses were to report that they were economically deprived.

The descriptive results presented so far seem to confirm the correlations in the theoretical framework and strengthen the hypotheses derived from them, but these hypotheses need to be tested more rigorously, which will be done in the next section.

Table 7-6 The relationship between the mean of women aged 60 and over’s share of household income and their subjective economic well-being for different living arrangements (weighted)

<table>
<thead>
<tr>
<th></th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deprived</td>
<td>Not deprived</td>
</tr>
<tr>
<td>Living with spouse</td>
<td>25</td>
<td>16</td>
</tr>
<tr>
<td>Living with adult children</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Living with spouse and adult children</td>
<td>13</td>
<td>13</td>
</tr>
</tbody>
</table>

Notes: The share of household income of women aged 60 and over is here presented as a percentage. Source: Author’s calculations using the CHARLS wave 1 (2011)

Table 7-7 The relationship between the mean of women aged 60 and over’s share of household income and their spouses’ subjective economic well-being for different living arrangements (weighted)

<table>
<thead>
<tr>
<th></th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deprived</td>
<td>Not deprived</td>
</tr>
<tr>
<td>Living with spouse</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>Living with spouse and adult children</td>
<td>15</td>
<td>14</td>
</tr>
</tbody>
</table>

Notes: The share of household income of women aged 60 and over is here presented as a percentage. Source: Author’s calculations using the CHARLS wave 1 (2011)
7.4.2 Logistic regression

In this chapter, results of logistic regression are presented (Table 7-8 and Table 7-9). Because subjective economic well-being is a dummy variable, logistic regression models were applied to the analysis. For ease of interpretation, I used the odds ratios (ORs) instead of log of odds in Table 7-8 and Table 7-9. As discussed in section 4.4.3, the results are interpreted in such a way that an OR value greater than 1 means there are relatively high odds of being deprived on subjective economic well-being. When the OR is less than 1, there are relatively low odds of being deprived on subjective economic well-being.

7.4.2.1 Relationship between women aged 60 and over’s share of household labour income and their subjective economic well-being under different living arrangements (by urban and rural areas)

The results of the logistic regressions (Table 7-8) revealed similar findings to those of the previous descriptive analysis. First, among households living with a spouse, an increase in rural women aged 60 and over’s share of household labour income increases their odds of reporting economic well-being deprivation (OR=1.036; p<0.05) (Model 1). However, for women aged 60 and over in urban areas, the share of household labour income had no effect on their subjective economic well-being (Model 4). The rural findings confirm Hypothesis 1, suggesting that women with a higher share of household labour income rate their economic well-being lower. This suggests that the relationship between women’s share of household labour income and their subjective well-being in rural areas is more in line with traditional gender role models. In contrast, for urban women aged 60 and over, the relationship between share of household income and subjective economic well-being is more in line with the unitary household model, according to which resources are shared equally among households in living arrangements in urban areas.
For households living with adult children, it can be concluded that there is no relationship between the share of household labour income and the subjective economic well-being of women aged 60 and over in both urban and rural areas (Models 2 and 5). In this case, however, there is a strong correlation between the share of household labour income and total household income. Rural women aged 60 and over with household incomes in the higher level had lower odds of reporting their economic well-being as deprived than women with household incomes in the lowest category (Middle quintile: OR= 0.603, p<0.05; Second highest quintile: OR=0.459, p<0.05; Top quintile: OR=0.354, p<0.01). The same findings were also found in urban areas (Middle quintile: OR=0.545, p<0.05; Second highest quintile: OR=0.396, p<0.01; Top quintile: OR=0.265, p<0.01). Also, the effect of household incomes on subjective economic well-being for urban women aged 60 and over was greater than the effect of household incomes on subjective economic well-being for women aged 60 and over in rural areas.

Similar findings were found in households living with a spouse and adult children (Models 3 and 6). There was no relationship between the share of household income of women aged 60 and over and their subjective economic well-being in either rural or urban areas. However, there was a strong association between subjective economic well-being and overall household incomes. Women aged 60 and over with household incomes in the higher quintile were significantly less likely to report deprivation of economic well-being than women aged 60 and over with household income in the lowest quintile (Rural: Middle quintile: OR=0.648, p<0.05; Second highest quintile: OR=0.445, p<0.01; Top quintile: OR=0.331, p<0.05. Urban: Middle quintile: OR=0.643, p<0.1; Second highest quintile: OR=0.397, p<0.05; Top quintile: OR=0.280, p<0.05.) Similarly, the positive impact of increased household incomes on the subjective economic well-being of women aged 60 and over was greater in urban than in rural areas. These findings confirm Hypothesis 3, confirming the unitary
household theory effect and suggesting that the influence of a filial culture is present and that resources are shared equally in households that include adult children.

In the analysis of the other control variables, age and education level were found to have no effect on the subjective economic well-being of Chinese women aged 60 and over in all models. This finding is quite robust given that the model holds across different areas (rural and urban) where women live with different household members. In addition, living arrangement preferences of women aged 60 and over were only found to be significant in the urban model of living with a spouse (Model 4). This model found that urban women aged 60 and over who preferred to live in the same community/village as their children were 66% more likely to report economic well-being deprivation than urban women aged 60 and over who preferred to live with their children. However, the finding was only significant at a p-value of less than 0.1.

A particular finding was that instrumental support from non-cohabiting adult children was found to have an impact on the subjective economic well-being of women aged 60 years and over in all models. Women aged 60 and over who received instrumental support from non-cohabiting adult children were less likely to report being deprived of their economic well-being than women aged 60 and over who did not receive that support. In addition, financial support from non-cohabiting adult children was only found to be significant in urban women aged 60 or over living with a spouse and adult children (Model 6). Financial support significantly reduced the odds of reporting economic well-being deprivation for urban women aged 60 and over (OR=0.481, p<0.05). Emotional support from non-cohabiting adult children could significantly reduce the odds of urban women aged 60 and over living with their spouse reporting that their economic well-being was deprived (OR=0.269, p<0.05). In addition, the increased number of adult children living nearby reduced the odds of women aged 60 and over reporting economic well-being deprivation, but
only if they lived with their adult children (Models 2 and 4) (rural: OR=0.835, p<0.1; urban: OR=0.733, p<0.05).

In addition, the number of adult household members was only found to be statistically significant in Models 2 and 4. These results suggest that for women aged 60 and over who live with their adult children, an increase in the number of adult members of the household increases their odds of reporting a positive level of economic well-being (rural: OR=0.773, p<0.05; urban: OR=0.819, p<0.1). In addition to this, it is worth noting that in multigenerational households with adult children (Models 2 and 4: living with adult children; Models 3 and 6: living with a spouse and adult children), an increase in the number of grandchildren significantly decreases the odds of reporting positive subjective economic well-being for women aged 60 and over (rural: OR=1.018, p<0.05; OR=1.209, p< 0.1; urban: OR=1.097, p<0.05; OR=1.248, p<0.1).

---

48 The siblings of the adult children the women were living with were nearby.
Table 7-8 Relationship between women aged 60 and over’s share of household income and their subjective economic well-being under different living arrangements (by urban and rural areas) (weighted)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Rural Living with a spouse</th>
<th>Rural Living with adult children</th>
<th>Rural Living with a spouse and adult children</th>
<th>Urban Living with a spouse</th>
<th>Urban Living with adult children</th>
<th>Urban Living with a spouse and adult children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of household labour income</td>
<td>1.036**</td>
<td>0.997</td>
<td>0.995</td>
<td>1.002</td>
<td>1.001</td>
<td>1.005</td>
</tr>
<tr>
<td></td>
<td>(2.06)</td>
<td>(-0.61)</td>
<td>(-1.22)</td>
<td>(0.98)</td>
<td>(0.40)</td>
<td>(0.78)</td>
</tr>
<tr>
<td>Age</td>
<td>0.759</td>
<td>1.109</td>
<td>0.804</td>
<td>0.980</td>
<td>0.752</td>
<td>1.610</td>
</tr>
<tr>
<td></td>
<td>(-1.01)</td>
<td>(0.30)</td>
<td>(-0.60)</td>
<td>(-0.05)</td>
<td>(-0.67)</td>
<td>(0.74)</td>
</tr>
<tr>
<td>Age square</td>
<td>1.002</td>
<td>0.999</td>
<td>1.001</td>
<td>1.000</td>
<td>1.002</td>
<td>0.996</td>
</tr>
<tr>
<td></td>
<td>(0.96)</td>
<td>(-0.33)</td>
<td>(0.52)</td>
<td>(0.03)</td>
<td>(0.71)</td>
<td>(-0.82)</td>
</tr>
<tr>
<td>Education level (reference group: Illiterate)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can read or write</td>
<td>0.994</td>
<td>0.996</td>
<td>0.741</td>
<td>1.095</td>
<td>0.367</td>
<td>0.813</td>
</tr>
<tr>
<td></td>
<td>(-0.03)</td>
<td>(-0.01)</td>
<td>(-1.14)</td>
<td>(0.23)</td>
<td>(-1.48)</td>
<td>(-0.54)</td>
</tr>
<tr>
<td>Primary school</td>
<td>0.842</td>
<td>0.749</td>
<td>0.858</td>
<td>1.467</td>
<td>1.330</td>
<td>1.518</td>
</tr>
<tr>
<td></td>
<td>(-0.69)</td>
<td>(-0.61)</td>
<td>(-0.47)</td>
<td>(1.02)</td>
<td>(0.36)</td>
<td>(1.07)</td>
</tr>
<tr>
<td>Secondary school or above</td>
<td>1.380</td>
<td>0.367</td>
<td>0.624</td>
<td>0.997</td>
<td>1.087</td>
<td>0.938</td>
</tr>
<tr>
<td></td>
<td>(0.77)</td>
<td>(-0.65)</td>
<td>(-0.85)</td>
<td>(-0.01)</td>
<td>(0.12)</td>
<td>(-0.12)</td>
</tr>
<tr>
<td>Living arrangements preferences (reference group: Live with adult children)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live in the same community/village</td>
<td>0.986</td>
<td>1.332</td>
<td>0.892</td>
<td>1.660*</td>
<td>1.751</td>
<td>1.060</td>
</tr>
<tr>
<td></td>
<td>(-0.08)</td>
<td>(0.69)</td>
<td>(-0.50)</td>
<td>(1.65)</td>
<td>(1.24)</td>
<td>(0.19)</td>
</tr>
<tr>
<td>Neither in the same house nor the same</td>
<td>1.083</td>
<td>1.262</td>
<td>0.428</td>
<td>1.296</td>
<td>0.387</td>
<td>1.065</td>
</tr>
<tr>
<td></td>
<td>(0.22)</td>
<td>(0.26)</td>
<td>(-1.23)</td>
<td>(0.45)</td>
<td>(-0.49)</td>
<td>(0.10)</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------</td>
<td>--------</td>
<td>---------</td>
<td>--------</td>
<td>---------</td>
<td>--------</td>
</tr>
<tr>
<td>Live in a nursing house</td>
<td>2.137</td>
<td>1.128</td>
<td>3.151</td>
<td>2.113</td>
<td>1.115</td>
<td>0.512</td>
</tr>
<tr>
<td></td>
<td>(0.95)</td>
<td>(0.12)</td>
<td>(1.37)</td>
<td>(1.40)</td>
<td>(1.12)</td>
<td>(-0.73)</td>
</tr>
<tr>
<td>Other</td>
<td>0.394</td>
<td>0.265</td>
<td>0.565</td>
<td>0.777</td>
<td>1.117</td>
<td>0.708</td>
</tr>
<tr>
<td></td>
<td>(-1.05)</td>
<td>(-0.85)</td>
<td>(-0.47)</td>
<td>(-0.36)</td>
<td>(0.09)</td>
<td>(-0.28)</td>
</tr>
<tr>
<td>Financial support from non-coreident adult children (reference group: No)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.948</td>
<td>0.736</td>
<td>0.643</td>
<td>0.785</td>
<td>0.629</td>
<td>0.481**</td>
</tr>
<tr>
<td></td>
<td>(-0.29)</td>
<td>(-0.91)</td>
<td>(-2.71)</td>
<td>(-0.90)</td>
<td>(-1.02)</td>
<td>(-2.33)</td>
</tr>
<tr>
<td>Instrument support from non-coreident adult children (reference group: No)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.562***</td>
<td>0.122***</td>
<td>0.809**</td>
<td>0.502***</td>
<td>0.205**</td>
<td>0.742*</td>
</tr>
<tr>
<td></td>
<td>(-3.12)</td>
<td>(-3.22)</td>
<td>(-2.48)</td>
<td>(-2.68)</td>
<td>(-2.60)</td>
<td>(-2.05)</td>
</tr>
<tr>
<td>Emotion support from non-coreident adult children (reference group: No)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.897</td>
<td>1.046</td>
<td>0.803</td>
<td>0.269**</td>
<td>1.577</td>
<td>0.828</td>
</tr>
<tr>
<td></td>
<td>(-0.48)</td>
<td>(0.28)</td>
<td>(-1.55)</td>
<td>(-2.54)</td>
<td>(1.49)</td>
<td>(-0.36)</td>
</tr>
<tr>
<td>Numbers of adult household members</td>
<td>0.937</td>
<td>0.733**</td>
<td>0.930</td>
<td>0.752</td>
<td>0.819*</td>
<td>0.830</td>
</tr>
<tr>
<td></td>
<td>(-0.31)</td>
<td>(-0.06)</td>
<td>(-0.89)</td>
<td>(-1.53)</td>
<td>(-1.90)</td>
<td>(-1.19)</td>
</tr>
<tr>
<td>Numbers of grand adult children in the households</td>
<td>0.953</td>
<td>1.018**</td>
<td>1.209*</td>
<td>0.724</td>
<td>1.097**</td>
<td>1.284*</td>
</tr>
<tr>
<td></td>
<td>(-0.32)</td>
<td>(0.11)</td>
<td>(1.71)</td>
<td>(-0.84)</td>
<td>(0.19)</td>
<td>(1.73)</td>
</tr>
<tr>
<td>Numbers of adult children live nearby</td>
<td>0.937</td>
<td>0.835*</td>
<td>1.123</td>
<td>1.018</td>
<td>0.733**</td>
<td>1.031</td>
</tr>
<tr>
<td></td>
<td>(-0.99)</td>
<td>(-1.82)</td>
<td>(1.62)</td>
<td>(0.17)</td>
<td>(-1.24)</td>
<td>(0.24)</td>
</tr>
<tr>
<td>Total household income level (reference group: Bottom quintile)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second lowest quintile</td>
<td>0.770</td>
<td>0.495</td>
<td>1.312</td>
<td>0.904</td>
<td>1.534</td>
<td>1.454</td>
</tr>
<tr>
<td></td>
<td>(-1.20)</td>
<td>(-1.35)</td>
<td>(0.73)</td>
<td>(-0.24)</td>
<td>(0.88)</td>
<td>(0.87)</td>
</tr>
<tr>
<td>Quintile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.593</td>
<td>0.603**</td>
<td>0.648**</td>
<td>1.378</td>
<td>0.545**</td>
<td>0.643*</td>
</tr>
<tr>
<td></td>
<td>(-1.55)</td>
<td>(-1.98)</td>
<td>(-1.75)</td>
<td>(0.81)</td>
<td>(-2.38)</td>
<td>(-2.71)</td>
</tr>
<tr>
<td>Second highest quintile</td>
<td>0.762</td>
<td>0.459**</td>
<td>0.445***</td>
<td>0.753</td>
<td>0.396***</td>
<td>0.397**</td>
</tr>
<tr>
<td></td>
<td>(-0.53)</td>
<td>(-2.13)</td>
<td>(-2.72)</td>
<td>(-0.70)</td>
<td>(-2.96)</td>
<td>(-2.19)</td>
</tr>
<tr>
<td>Top quintile</td>
<td>0.429</td>
<td>0.354***</td>
<td>0.331**</td>
<td>0.485</td>
<td>0.265***</td>
<td>0.280**</td>
</tr>
<tr>
<td></td>
<td>(-1.59)</td>
<td>(-3.08)</td>
<td>(-1.70)</td>
<td>(-1.60)</td>
<td>(-2.60)</td>
<td>(-2.51)</td>
</tr>
<tr>
<td>Missing</td>
<td>0.770</td>
<td>0.495</td>
<td>1.312</td>
<td>0.904</td>
<td>1.534</td>
<td>1.454</td>
</tr>
<tr>
<td></td>
<td>(-1.20)</td>
<td>(-1.35)</td>
<td>(0.73)</td>
<td>(-0.24)</td>
<td>(0.88)</td>
<td>(0.87)</td>
</tr>
<tr>
<td>Observations</td>
<td>696</td>
<td>231</td>
<td>468</td>
<td>457</td>
<td>155</td>
<td>297</td>
</tr>
<tr>
<td>Pseudo R-squared</td>
<td>0.0850</td>
<td>0.0899</td>
<td>0.0329</td>
<td>0.111</td>
<td>0.104</td>
<td>0.108</td>
</tr>
</tbody>
</table>

Robust z-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1
7.4.2.2 Relationship between women aged 60 and over's share of household labour income and their spouses' subjective economic well-being under different living arrangements (by urban and rural areas)

Table 7-9 show the relationship between women aged 60 and over's share of household income and their spouse's subjective economic well-being under different living arrangements (by urban and rural areas). The data show that the household income shares of women aged 60 and over in rural areas is negatively associated with their spouse's subjective economic well-being in coupled households (Model 7). That is, the higher the household income share of women aged 60 and over, the higher the odds of their spouse reporting negative economic well-being (OR=1.090, p<0.05). In such cases as urban couple households (model 8) and multigenerational households (with a spouse and adult children) in rural areas (model 9) and urban areas (model 10), the household income shares of women aged 60 and over had no effect on the subjective economic well-being of their spouse. However, in these models, higher household income decreases the odds of spouses reporting negative economic well-being (rural multigenerational households: Middle quintile: OR=0.602, p<0.1; Second highest quintile: OR=0.389, p<0.01; Top quintile: OR=0.170, p<0.01. Urban couple households: Middle quintile: OR=0.719, p<0.05; Second highest quintile: OR=0.635, p<0.05; Top quintile: OR=0.453, p<0.05. Urban multigenerational households: Middle quintile: OR=0.635, p<0.05; Top quintile: OR=0.453, p<0.05. quintile: OR=0.779, p<0.1; Second highest quintile: OR=0.681, p<0.05; Top quintile: OR=0.504, p<0.05). These findings are consistent with the analysis in the previous section (section 7.4.2.1) and suggest that in rural households containing only couples, the distribution of resources within the household is more in line with the assumptions of traditional gender ideology. That is, the higher the share of household income by rural women aged 60 and over, the higher the odds that they and their spouses would rate their economic well-being as deprived. Conversely, in urban households that include only couples and in rural and urban households that include adult children as well as couples, the distribution of
resources within households is more consistent with the unitary household model. In these households, resources are shared and the economic well-being of individuals is more dependent on the total income of the household.

### Table 7-9 Relationship between women aged 60 and over's share of household income and their spouses' subjective economic well-being under different living arrangements (by urban and rural areas) (weighted)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Living with a spouse</td>
<td>Living with a spouse and adult children</td>
</tr>
<tr>
<td></td>
<td>Model 7 (OR)</td>
<td>Model 8 (OR)</td>
</tr>
<tr>
<td>Share of household labour income</td>
<td>1.090**</td>
<td>0.998</td>
</tr>
<tr>
<td></td>
<td>(0.27)</td>
<td>(-0.64)</td>
</tr>
<tr>
<td>Spouse’s age</td>
<td>0.670*</td>
<td>0.692</td>
</tr>
<tr>
<td></td>
<td>(-1.71)</td>
<td>(-1.29)</td>
</tr>
<tr>
<td>Spouse’s age square</td>
<td>1.003</td>
<td>1.003</td>
</tr>
<tr>
<td></td>
<td>(1.55)</td>
<td>(1.23)</td>
</tr>
<tr>
<td>Spouse’s education level (reference group: Illiterate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can read or write</td>
<td>0.748</td>
<td>0.966</td>
</tr>
<tr>
<td></td>
<td>(-1.11)</td>
<td>(-0.11)</td>
</tr>
<tr>
<td>Primary school</td>
<td>0.692</td>
<td>0.721</td>
</tr>
<tr>
<td></td>
<td>(-1.52)</td>
<td>(-1.13)</td>
</tr>
<tr>
<td>Secondary school or above</td>
<td>0.491**</td>
<td>0.479**</td>
</tr>
<tr>
<td></td>
<td>(-2.42)</td>
<td>(-2.11)</td>
</tr>
<tr>
<td>Spouse’s living arrangements preferences (reference group: Live with adult children)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live in the same community/village</td>
<td>1.148</td>
<td>1.076</td>
</tr>
<tr>
<td></td>
<td>(0.75)</td>
<td>(0.30)</td>
</tr>
<tr>
<td>Neither in the same house nor the same community/village</td>
<td>0.814</td>
<td>1.100</td>
</tr>
<tr>
<td></td>
<td>(-0.60)</td>
<td>(0.15)</td>
</tr>
<tr>
<td>Live in a nursing house</td>
<td>0.489</td>
<td>2.592</td>
</tr>
<tr>
<td></td>
<td>(-1.20)</td>
<td>(1.37)</td>
</tr>
<tr>
<td>Other</td>
<td>0.408</td>
<td>1.732</td>
</tr>
<tr>
<td></td>
<td>(-1.06)</td>
<td>(0.65)</td>
</tr>
<tr>
<td>Financial support from non-coreresident adult children (reference group: No)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.341</td>
<td>1.171</td>
</tr>
<tr>
<td></td>
<td>(1.60)</td>
<td>(0.72)</td>
</tr>
<tr>
<td>Instrument support from non-coreresident adult children (reference group: No)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.528***</td>
<td>0.678***</td>
</tr>
<tr>
<td></td>
<td>(-3.52)</td>
<td>(-2.57)</td>
</tr>
</tbody>
</table>
### 7.5 Sensitivity checks

Due to the large number of missing values in the independent variables used in this chapter, I used individual cross-sectional weights with non-response adjustment in the analysis (see the discussion of this weight in section 3.3.3). Therefore, to verify the robustness of the results, I also did a sensitivity check on this weight. Table A7-1-1 and Table A7-1-2 (see Appendix A7-1) reflect the results without the inclusion of this weight. After comparing the results without the weight with the results with the weight, it was found that the predicted results of the variables in the model did not change significantly after the inclusion of this weight. It is important to note that some variables became weaker or stronger in their effect on subjective economic well-being, such as the share of household income and the number of grandchildren.
within the household. However, no change from insignificant to significant or vice versa was found. The direction of the relationship between these significant results and subjective economic well-being did not change either. Therefore, it can be said that my regression results are robust and insightful.
7.6 Discussion

The purpose of this chapter was to examine how women aged 60 and over’s share of household income affects their subjective well-being and the subjective well-being of their spouses. In particular, it extends the analysis of previous literature exploring intra-household resource dynamics focusing only on husband-and-wife households to multi-generational households. With regard to the relationship between household income shares and subjective economic well-being for women aged 60 and over, the results of the CHARLS data show variability across geographical regions and types of households living arrangements. Specifically, in rural households containing only older couples, an increase in the share of household income of women aged 60 and over reduces their odds of reporting positive economic well-being but increases the odds of their spouse reporting positive economic well-being. This may indicate that women aged 60 and over and their spouses in rural coupled households subscribe to the ideological concept of a ‘male breadwinner’. That is, these women aged 60 and over are happy to live with a male who is the dominant earner, while their spouses are happier when their wives have a smaller share of household income.

As noted at the beginning of this chapter, this finding is consistent with previous research on the impact of traditional gender role awareness on the economic well-being of both spouses within households. This previous research emphasises the provider role of men (Kulic et al., 2020), whose traditional masculinity may be threatened if their female partner has more wealth than they do (Kan & Laurie, 2014; Menaghan, 1991). This was evident in the case of the rural coupled households in this chapter, for whom the husbands’ economic satisfaction decreased in opposite proportion to their wives’ wealth. However, the results also indicate that for urban coupled households, individual economic well-being is related to the total income of the household and not to individual shares of household income. This provides supporting evidence for the unitary household model, according to which
resources are shared equally within the family (Molina et al., 2007; Rojas, 2005, 2007).

Similarly, regarding both urban and rural households that include adult children and older couples, the results of this study suggest that women aged 60 and over's share of household income has no impact on their subjective economic well-being, as members within the household share the resources equally. This provides complementary evidence to scholarly research investigating the impact of filial culture on adult children’s support for their parents observed in households in which older adults live with their adult children (Fan et al., 2018; Lei et al., 2015; Qu, 2015). It indicates that in multigenerational households, adult children continue to follow the influence of the tradition of reciprocity in filial culture by supporting their parents.

In addition, this study also observed differential effects on individual economic well-being based on location (urban–rural), gender and living arrangements for a number of commonly used socio-demographic variables. First, the effect of age on the subjective economic well-being of women aged 60 and over was not statistically significant in all models tested. This finding is inconsistent with previous studies that have found that older cohorts typically report higher economic well-being than younger cohorts (Airio & Nurminen, 2016; Ginn, 2008; Hansen et al., 2008; Hsieh, 2004; Litwin & Sapir, 2009; Palomäki, 2019; Stoller & Stoller, 2003). However, in rural couple households, the relationship between the age of spouses of women aged 60 and over and their own subjective economic well-being is consistent with the previous hypothesis that the older the spouse is, the greater the probability that they report positive economic well-being. Second, the effect of education level on the subjective economic well-being of women aged 60 and over is not statistically significant, while the effect of education level on the subjective economic well-being of their spouses is found to be significant in most models. As mentioned in section
1.2, the women aged 60 and over in this study did not have a very high level of education for socio-historical reasons, meaning that it is possible that this finding is due to the small sample of women aged 60 and over with higher education, leading to insignificant results.

In addition, the results show that for both rural and urban women aged 60 and over living with adult children, an increase in the number of adult household members increases their odds of reporting positive economic well-being. This finding is partially consistent with earlier literature that increases in household size, and in particular the number of adults in the household, increases the overall income level of the household and thus affects the economic well-being of individuals in the household (Deng et al., 2019). However, a noteworthy phenomenon is that in multigenerational households with children (living with adult children or with a spouse as well as adult children), women aged 60 and over are significantly more likely to report a deprivation of their subjective economic well-being when the number of grandchildren increases. When combined with the finding that the share of household income of women living in these households has no effect on their subjective economic well-being, one possible explanation for this is that in multigenerational households with children, women aged 60 and over gain bargaining power through caring for grandchildren and therefore have equal access to household resources. Another finding is that an increase in the number of grandchildren within the household has little impact on the subjective economic well-being of the spouse. This may corroborate previous literature that the responsibility for caring for grandchildren within the household often lies with women (Arpino et al., 2018).

However, the above findings should be considered in the context of a number of limitations. First, the subjective assessment of respondents' economic well-being only appeared in the CHARLS baseline questionnaire, and the associated question
was removed in the following two waves. This chapter therefore consists of an analysis based on cross-sectional data and does not capture the changes in the relationship of the share of household income of women aged 60 and over and their subjective economic well-being.

Another issue to consider is selection effects. In the above interpretation of the relationship between the household income shares of women aged 60 and over and their subjective economic well-being, I have done so mainly through the lens of intra-household gender ideology. But this may also be a result of selection. For example, it may be unrelated to the ‘male breadwinner’ mentality that an increase in the share of household income of women aged 60 and over in rural areas reduces their subjective perception of economic well-being. It may be that their contribution to household income increases because they choose to go out and earn more money because they feel that the financial situation in the household is poor. Therefore, the interpretation of the findings of this chapter cannot be said to be causal.

In addition, although a list of potentially confounding variables were controlled for, there could still be missing variables that would bias the results. Such variables might be related to the management of intra-household finances, which was not possible to consider in this analysis because it was not measured by the CHARLS questionnaire. Previous research has also shown that women can gain additional power by relying on non-traditional forms of money management according to which the management of each spouse is independent and the wife has control over her own income and sole responsibility for her expenses, thereby increasing their economic satisfaction (Kulic et al., 2020).

In addition, this paper only examines the share of household income and subjective economic well-being of women aged 60 and over and their spouses in older coupled households and multigenerational households with adult children. Future research
could consider the share of household income and subjective economic well-being of women aged 60 and over and their spouses in living arrangements with other family members (e.g., relatives and friends) as well as in LGBT households.

Further, as the number of women aged 60 and over living with their adult children is relatively small, there may be measurement errors in the model predicting the relationship between the share of household income and the subjective economic well-being of women aged 60 and over and their spouses in this type of living arrangement. Subsequent studies could further investigate this relationship by increasing the sample size. Finally, although geographical differences between urban and rural areas were considered, differences between provinces could not be examined due to sample size limitations. Subsequent studies could explore such differences.

However, despite these limitations, the findings of this chapter have some practical implications. First, the new perspective provided here extends the relative income hypothesis by shifting the research focus from within couples to within families and from younger couples to older couples. In addition, the study provides an empirical test of intra-household distribution patterns. More specifically, it considers intra-household bargaining and income distribution patterns at the multigenerational level. Finally, the focus on China allows for analysis of an unexplored social and economic context characterised by a large gender gap in social benefits and a persistence of traditional attitudes regarding gender roles (Gou, 2015).
Conclusion

Finally, we come to the end of the thesis. After taking the reader on a long adventure, this journey is now coming to an end. This chapter aims to summarise the content and findings of this PhD thesis and discuss more general conclusions that can be inferred from this research. The chapter concludes with a reflection on the research process and some suggestions for future research.

Summary

The entire doctoral thesis unfolds around the theme of the role of the family. This theme is explored through an analysis of the relationship between living arrangements and women aged 60 and over’s well-being. In the first chapter of this thesis, in order to give the reader a clearer idea of the purpose of my research, I pose the question: why do I want to study the relationship between living arrangements and the well-being of women aged 60 and over in China? By reviewing the entire life course of women aged 60 and over living in China in the twenty-first century, it is evident that contemporary Chinese women aged 60 and over end up relying heavily on family support due to the double hardship of accumulating disadvantages in the early stages of their life and the gender blindness of the state’s social security policies. At the same time, changes in family support resulting from changes in living arrangements may have an impact on their well-being. In order to explore this impact, a review of the relevant literature was also presented in Chapter 1.

The review found that while the relationship between changing living arrangements and the well-being of people aged 60 and over has received considerable academic attention, the impact of new living arrangements on the well-being of women aged 60 and over in China has not received sufficient attention. Very little research has been conducted specifically on women aged 60 and over. The few studies that have
investigated this topic have examined the relationship between living arrangements and people aged 60 and over’s well-being, either by looking at the older population as a whole or from a comparative gender perspective. Furthermore, current research on the subject suffers from biases in the measurement of women aged 60 and over’s well-being. The multidimensional character of well-being is ignored, and the measurement of the economic dimension of well-being does not truly reflect the economic situation of individuals. These biases may lead to a lack of accurate and objective analysis of the relationship between living arrangements and women aged 60 and over’s well-being. The elaboration of these issues answered the question posed at the beginning of the chapter.

Chapter 1 then addresses the problems discussed above by posing the research questions of this thesis, namely the questions of how to understand and measure the well-being of women aged 60 and over in China and how living arrangements affect the well-being of women aged 60 and over in China. The first research question centres on the understanding of the well-being of women aged 60 and over in China, which provides a corrective to previous issues in the literature where the definition of well-being was not fully understood and measured. The second question focuses on the impact of changes in the living arrangements of women aged 60 and over in China on their well-being, to fill a gap in the literature on this topic that lacks a nationally representative sample and longitudinal analysis.

Chapter 2 discusses the limitation of current research in the literature identified in the literature review in Chapter 1, namely the issue of bias in the measurement of well-being in women aged 60 and over. It first introduces the current academic discourse on the concept and measurement of well-being. At the same time, in order to gain a clearer understanding of the well-being of contemporary Chinese women aged 60 and over, the chapter also builds on the current academic discussion of well-being measurement frameworks. The chapter constructs a conceptual and
measurement framework specifically designed to improve understanding the well-being of Chinese women aged 60 and over, taking into account the social context of China and the characteristics of the contemporary Chinese women aged 60 and over.

**Chapter 3** focuses on the analytical methods and data to be used in the thesis. It clarifies why quantitative research was chosen as the analytical method for this thesis and why China Health and Retirement Longitudinal Study (CHARLS) data was used to conduct the research. In addition to this, the chapter provides a critical reflection on the use of CHARLS data and clarifies its limitations. Then this chapter discussed the subsampling process, as this thesis concerns women aged 60 and over only. Furthermore, this chapter identifies possible problems with the representativeness of the subsampling.

The focus in **Chapter 4** turns to the process of operationalising the concepts discussed in the previous chapters in the data and the statistical models to be used in the analysis process. This chapter is more technical, and, as such, a great deal of statistical relevance is discussed. This chapter focuses on the operationalisation of the well-being of women aged 60 and over and their economic well-being and provides a descriptive analysis of their distribution in the sample.

From **Chapter 5** onwards, this thesis formally moves into the findings section. **Chapter 5** focuses on the first research question: how do changes in living arrangements affect the well-being of women aged 60 and over in China? This question is explored through the use of a fixed effects model. The findings show that living arrangements have a significant impact on the overall level of well-being and the levels of the dimensions of well-being of women aged 60 and over in China, but there are urban-rural differences. For rural women aged 60 and over, the effect of living with a spouse on improving women aged 60 and over’s well-being was significant and positive, but similar findings were not found in urban areas. In
addition, unlike previous studies, my study did not find a positive effect of living with children on women aged 60 and over’s well-being (Chan et al., 2002; Mutchler et al., 2015; Sun, 2002; Yamada & Teerawichitchainan, 2015); in contrast, my findings suggest that the effect of living with adult children on rural women aged 60 and over’s well-being is negative. First, this may reflect the fact that living with children creates conflict (Do & Malhotra, 2012; Lin & Chen, 2018; Russell, 2009; Thomas et al., 2017). This may have a negative impact on the well-being of women aged 60 and over. Second, it may also reflect that living with and receiving support from adult children may be conditional. In addition to enjoying the support provided by their adult children, people aged 60 and over often have the responsibility of caring for their grandchildren (Huang, 2018; Yan et al., 2003). This is also reflected in the analysis, which shows that increased numbers of grandchildren in the household significantly increases well-being deprivation scores for urban women aged 60 and over and rural women aged 60 and over. This is a highly noteworthy phenomenon because in today’s China, although the government has implemented some policies to safeguard the welfare of people aged 60 and over, these policies are extremely unfavourable towards women. The government still advocates adult children support their parents. Therefore, the reduced level of well-being that may exist when living with adult children is of concern (Zhou, 2019).

Since the measurement of economic well-being in Chapter 5 does not include a measure of the subjective economic well-being, in Chapter 6 I turn my attention to the economic well-being (including both objective and subjective components of economic well-being) of women aged 60 and over. This chapter focuses the impact of different types of living arrangements on women aged 60 and over’s economic well-being. The results showed that there are urban–rural differences in the impact of living arrangements on women aged 60 and over’s economic well-being. In rural areas, the economic well-being of women aged 60 and over living alone is better than that of women aged 60 and over living in other forms of living arrangements. In
urban areas, the economic well-being of women aged 60 and over living with their spouse and adult children is better than that of women aged 60 and over living in other forms of living arrangements.

The findings in Chapter 6 are also different from those in Chapter 5 on economic well-being. In Chapter 5, I found that spouses and adult children had a negative effect on the economic well-being of rural women aged 60 and over, they had no effect on the economic well-being of urban women aged 60 and over. In Chapter 6, I take into account subjective measures of economic well-being and find that the role of spouse and children on their economic well-being is also likely to be negative for rural women aged 60 and over, but the opposite is true for urban women. Urban women aged 60 and over who lived with their spouse and adult children had better economic well-being than women in any other living arrangement. The difference between the findings in Chapter 5 and Chapter 6 may be due to an unequal distribution of resources within households. To gain a more comprehensive understanding of the relationship between the distribution of resources within households and the economic well-being of women aged 60 and over in China, I use subjective economic well-being specifically to analyse this issue in Chapter 7 that follows.

Chapter 7, therefore, turns to intra-household dynamics, focusing on how the subjective economic well-being of a woman aged 60 and over living within the household is influenced by her bargaining power within the household and the gender ideology of the household. At the same time, an analysis of spousal subjective economic well-being is included in the analysis to minimise the effects of heterogeneity between households and obtain more accurate estimates. The results of the study show that women aged 60 and over living with their spouse in rural, coupled households tend to have a ‘male breadwinner’ mentality. This is evident in the fact that in rural households of older couples, an increase in the household
income shares of women aged 60 and over decreases both their own and their spouse’s chances of reporting positive economic well-being. On the other hand, for urban women aged 60 and over, an increase in the household income share has no effect on their subjective economic well-being. In addition, in multigenerational households (those living with adult children or living with spouse and adult children), the same conclusion is reached, i.e., an increase in the household income share of women aged 60 and over has no effect on their subjective well-being. However, a phenomenon was observed in all these households where an increase in total household income was associated with an increase in women aged 60 and over’s subjective economic well-being. This suggests that in these households, the intra-household resources allocation is more in line with the unitary household model, where household resources are enjoyed equally by family members (Molina et al., 2007; Rojas, 2005). A noteworthy phenomenon, however, is that in multigenerational households living with adult children, the level of subjective economic well-being of women aged 60 and over decreases significantly when the numbers of grandchildren in the household increases. Combined with these findings, one possible explanation is that in multigenerational households with adult children, women aged 60 and over gain bargaining power through caring for grandchildren and therefore have equal access to household resources.

**Research implications and contributions**

Previous research on well-being in China has not focused on women aged 60 and over. By reviewing the socio-historical events experienced by this particular group, this thesis details how this group of women is far more dependent on family support than their male peers and the next generation of women, due to the combined effects of early accumulated disadvantage and the gender blindness of social security policy. It also reveals unprecedented challenges to the well-being of this group of women as a result of the decline in family support, particularly from adult children, due to changes in living arrangements. By presenting and discussing the
current dilemmas and challenges faced by this particular group of women, this study calls for more research on the well-being of this group to be conducted, hopefully drawing the attention of policy makers and researchers in related fields.

The first methodological contribution of this study is the presentation of a new measurement framework. Specifically, most of the previous studies measuring well-being of women aged 60 and above were based on the measurement of the subjective dimension of well-being. This study's measure of well-being is based on both subjective and objective dimensions, and therefore it is more reflective of the full meaning of well-being. Most previous studies have measured the economic dimension of well-being based on the theory that resources are equally distributed within the household, using household-level measures such as per capita household income to assess individual women's economic well-being. However, this assumption is refuted by much empirical evidence, as the distribution of resources within households is not always consistent with the 'equal sharing' assumption and may be influenced by individual bargaining power. Thus, using household-level economic well-being to represent the individual-level economic well-being of women aged 60 and over may result in the level of economic well-being of these women being overestimated by the researcher. With this bias in mind, I have chosen indicators that provide a true picture of these women's economic well-being, such as informal work, asset ownership and subjective economic well-being. These indicators allow for a comprehensive assessment of individual and household well-being and the outcome of the interaction between individual and household well-being. In other words, they can capture individual economic well-being under the influence of household economic well-being, thus obtaining the true level of economic well-being of women aged 60 and over within the household. The above approach to measuring well-being and the detailed ideas of how the approach was proposed can be a good inspiration for future researchers working on related studies.
In addition, a second methodological contribution of this study is that it modifies the methodology of previous studies that were able to calculate bargaining power only between couples, making it possible to apply it more broadly to the calculation of bargaining power between more family members (for example, calculating bargaining power for women living with their spouses and adult children). This provides a new measure for future research concerned with bargaining power in multigenerational households.

Another important methodological contribution of this thesis is a reflection on the application of CHARLS data and suggestions for future data collection. Specifically, I explore the problems with CHARLS data in measuring the well-being of women aged 60 and over in China. In the practical application of the measurement framework to the analysis, I identify key missing predictor variables such as subjective economic well-being, which is only present in the first wave of CHARLS data. I also look at social cohesion, which affects the well-being of women aged 60 and over, and the frequency and intensity of non-cohabiting adult children’s support, which are not addressed in the CHARLS data. Furthermore, most of the variables associated with measures of well-being are categorical variables, so only ill-being can be measured when operationalising the well-being measurement framework into CHARLS data. Future researchers may need to obtain more continuous indicators for well-being measurements from data collection in order to obtain a more accurate and comprehensive measure of well-being. These reflections allow other researchers working on related studies to better understand and effectively use CHARLS data. They will help future investigators to design questionnaires that will yield more reliable data.

A major contribution of this study is that it fills a gap in current academic research on the living arrangements and well-being of women aged 60 and over in China.
Longitudinal studies using nationally representative samples are particularly lacking in these studies. Using a nationally representative sample of CHARLS, this study details the relationship between the living arrangements of Chinese women aged 60 and over and their overall well-being and the dimensions of well-being through a longitudinal approach. By comparing the well-being of these women across different types of living arrangements and the transitional trajectories of these living arrangements, this study extends the understanding of existing research on the impact of living arrangements and their changes on the well-being of women aged 60 and over in China.

This study also empirically examines intra-household distribution patterns. It considers intra-household bargaining and intra-household resource distribution at the multigenerational level, and provides empirical evidence for current academic research on intra-household resource distribution. It shifts the focus of the study from within couples to within multigenerational households. This look at intra-household distributional differences provides a more intuitive view of the relationship between the contribution of women aged 60 and over to the household and their individual economic well-being.

Previous research on the impact of living arrangements on the well-being of women aged 60 and over in China has given little consideration to urban-rural differences. Differences in the impact of family living arrangements on the well-being of these women living in urban and rural areas were noted in my study. In particular, the impact of the same type of family members on the well-being of these women living in different areas varied considerably. For women aged 60 and over in rural areas, living with adult children does not necessarily improve the well-being of these women, but may have a negative impact on it. Also, gaining support from adult children by living with them is no longer unconditional. Often, these women need to gain the support of their adult children by providing care for their grandchildren. On
the other hand, for urban women aged 60 and over, the role of spousal support is more pronounced, while the role of adult children’s support is not as significant as expected. These findings are inconsistent with previous studies that have considered children to be a strong support for their parents (Chan et al., 2002; Chen, 2016; Mutchler et al., 2015; Sun, 2002). The findings of this study reflect the weakening of traditional filial culture and the conditional nature of child support (Huang, 2018; Yan et al., 2003).

This is a very noteworthy phenomenon as some welfare policies that are relevant to people aged 60 and above in China today, such as pensions and health insurance, are very unfriendly to the female population. These policies do not take into account the fact that women aged 60 and over have low incomes and do not have good jobs early in their lives due to social circumstances and policies. They also ignore the fact that women have fewer years of working experience than men. The accumulation of these disadvantages prevents these women from having access to adequate social security after retirement, which in turn leads to them being far more dependent on their families than men of the same age. Worryingly, the Chinese government currently still advocates for adult children to support their parents rather than raising the level of social benefits for the older parents (Zhou, 2019).

In fact, the well-being challenges faced by these women aged 60 and over is largely a social issue in the context of shifting government responsibilities, inadequate social security policies and conditional adult children’s support. Therefore, this study generates some implications on existing policies based on these findings. Firstly, the government needs to take full account of the gender blindness of existing social security benefits when making relevant social security policies. In particular, they need to be mindful of the fact that the accumulation of disadvantages for these women aged 60 and over early in their lifetime results in their being unable to access more support from these social security benefits, forcing them instead to rely on
their families. Secondly, the government needs to improve the social support system for these women, rather than placing the onus of supporting these women exclusively on the family, as the support they receive while living with their adult children is likely to be conditional and their level of well-being is not necessarily enhanced as a result.

**Reflections on the study**

As this project draws to a close, I can look back at different aspects of my past PhD career regarding the research results, the research process and my personal development as a researcher. In the beginning, I thought that, with an analytical model, there would be clear research findings. However, as my research progressed, I became increasingly confused because the reasons behind social events are complex, and, in the models, I often just used certain variables to predict their impact. The situation is far more complex in the real world. What is even more painful is that different interpretations of the same analytical model can produce different conclusions. This made me question my assumptions not only during the study but still to this day.

Given the quantitative nature of my research, I experienced the advantages and challenges of using survey data. For example, the variable on personal subjective well-being, a variable that was not covered in the last two questionnaire surveys, left me feeling incredibly disillusioned. In addition, in the personal and household income panels, the constructed variables given in the CHARLS data do not indicate how these variables were constructed. Moreover, the fact that these variables had very few missing values made me suspicious. Thus, to ensure accuracy, I went back to the questionnaire and reconstructed these two variables. During this process, I sent inquiries to the CHARLS official asking for more information about the construction process of these two variables, but I did not receive a response. I had to use my own constructed variables in the analysis; however, fortunately, I found the
constructed results for these two variables on a third-party platform. By comparing the distribution of the two variables, I found consistency. These points provided some insight into the fact that much in research does not go as expected, and, many times, matters can be more complicated than we think.

Research Limitations and future research directions

First, one of the issues to focus on from the study is selection effects. Whether there is reverse causality in the findings I interpret in the thesis is a question that deserves some thought. For example, I found that living with adult children may have a negative impact on the overall level of well-being and on each dimension of well-being among rural women aged 60 and over. However, it is possible that this situation is under the selection effect. Some scholarly research has found that parents who are in poorer health or economic circumstances are more likely to live with their adult children in order to receive care and support from these adult children (Deng et al., 2019; Fan et al., 2018; Giles & Mu, 2007; Lei et al., 2012a). Furthermore, the fact that an increase in the share of household income of women aged 60 and above in rural areas reduces their subjective economic well-being is not necessarily due to their preference for a ‘male breadwinner’ mentality. It may be that their contribution to household income increases because they choose to go out and earn more money because they feel that the financial situation in the household is poor (Erman et al., 2002). So, in interpreting the findings, I cannot be sure of the causal relationship. The issue of selection effect should be considered in future studies. This may require the inclusion of some instrumental variables, such as the preferences of living arrangements in the CHARLS data, which could be used as an instrumental variable to examine the selection effect. However, given the time constraints of a PhD study, exploration of this issue could perhaps be undertaken later.

Second, future research could take into account certain family types that were
omitted from this study. Due to the study’s small sample size, such families as skipped-generation households (older parents and grandchildren) and kinship households were not included in the analysis. Therefore, the impact of these living arrangements on women aged 60 and over's well-being is not yet known. Future research may need to consider the impact of these family living arrangements. In addition, Chapter 7 examines only the relationship between the share of household income and the subjective economic well-being of women aged 60 and over and their spouses in coupled households and multigenerational households. Hence, future research may need to consider the relationship between the share of household income and the subjective economic well-being of women aged 60 and over and their spouses in living arrangements with other family members (e.g., relatives, friends) as well as in LGBT households.

Third, future research could provide a closer analysis of geographical differences. As the analysis was conducted separately for urban and rural areas, it is not possible to determine how women aged 60 and over move between urban and rural areas. The migration of women aged 60 and over from rural to urban living may also have some impact on their well-being due to differences in living standards. This could be taken into account in future studies. In addition, multilevel modelling could not be implemented in the analysis due to the limitations of the sample size. However, given that there are 34 provincial administrative regions in China, future studies may include multilevel modelling to capture more regional variation and reduce prediction bias.

Fourth, future research could look further and more closely at the trajectories of changes in living arrangements. Although the trajectory of changes in living arrangements was captured by the fixed effects model used in this study, changes in living arrangements between the three waves of the survey (e.g., from living with a spouse to living alone to living with adult children) were not known and only initial to
final changes could be observed in the analysis.

Finally, there are a number of issues regarding model predictions that future research could attempt to address. Due to data limitations, there is some measurement error in the variables regarding the non-coresident adult children’s support. Firstly, it is not possible to determine whether the non-coresident adult children's financial support is episodic or stable over time. Secondly, as the exact amount of instrumental support is not known, it is hard to determine the intensity of the instrumental support. In addition, emotional support only reflects the general emotional support from non-cohabiting children. It does not reflect the specific support from each child. In addition, as the number of women aged 60 and over living with their adult children is relatively small, there may be measurement errors in the findings when using the model to predict the relationship between the share of household income and the subjective economic well-being of women aged 60 and over and their spouses within this type of living arrangements; subsequent studies could increase the sample size to explore this relationship.
Bibliography


https://doi.org/10.1080/135457097338799


https://doi.org/10.1007/s10902-013-9466-3


https://doi.org/10.1177/138826271601800301


https://doi.org/10.1007/s10902-005-7694-x


https://doi.org/10.1016/j.worlddev.2006.12.005


Bai, C., & Gu, X. (2018). Cross-sectional inequalities in the construction of soap power in basic elderly care services in China—A multidimensional well-being measurement perspective (中国基本养老服务台皂力建设的横向不平等—)
多维福祉测量的视角. *Social Science Research, 2*, 105–113.


https://doi.org/10.1007/s11205-013-0251-9


https://doi.org/10.1080/13552074.2015.1053213


Sage Foundation.


https://doi.org/10.1007/s11205-020-02476-8


*Agricultural Technology Economy*, 4, 78–89.


https://doi.org/10.1017/S01446866X18000041


https://doi.org/10.1080/08959420.2014.977647


262


https://doi.org/10.1080/13600810601045833


Economic Research Institute for ASEAN and East Asia.


https://doi.org/10.1177/0164027511433879


https://doi.org/10.1016/B978-0-444-59428-0.00003-5


Dong, Q., Li, X., Yang, H., & Zhang, K. (2007). Gender Inequality in Rural Education


https://doi.org/10.1093/jae/eji025

https://doi.org/10.1093/jae/eji025


https://doi.org/10.16405/j.cnki.1004-129X.2020.06.005


https://doi.org/10.1007/978-3-319-39101-4


and Reply (农村老年女性多维贫困：现实与因应). *Agricultural Economics and Management, 2, 2.*


China’s Older Workers and Elderly in Comparative Perspective. In Aging in

Policies and prospects.


Gunnell, K. E., Mosewich, A. D., McEwen, C. E., Eklund, R. C., & Crocker, P. R. E.

https://doi.org/10.1016/j.paid.2016.11.032


https://doi.org/10.1007/s11205-012-0115-8


http://dx.doi.org.ezproxy.is.ed.ac.uk/10.1016/j.healthplace.2019.01.003

https://doi.org/10.1023/B:SOCI.0000003585.94742.aa


281


https://doi.org/10.2139/ssrn.2742083


https://doi.org/10.1111/roiw.12491


https://doi.org/10.1080/17538963.2015.1102473


https://doi.org/10.1111/j.1468-2397.2011.00794.x


Li, Q. (2020). Intergenerational differences in the concept of filial piety in the context of social transformation and the factors influencing it (社会转型背景下孝道观念的代际差异及其影响因素). *China Youth Studies, 3*.


http://dx.doi.org.ezproxy.is.ed.ac.uk/10.1080/13607863.2018.1460743


https://doi.org/10.1093/geront/gnp036


Logan, J. R., & Bian, F. (1999). Family values and coresidence with married children in


https://doi.org/10.1146/annurev.so.17.080191.002223


http://www.stats.gov.cn/tjsj/pcsj/rkpc/6rp/indexch.htm


on the Protection of the Rights and Interests of the Older People (中华人民共和国老年人权益保障法_中国人大网).


https://doi.org/10.1111/1467-6494.00051


https://doi.org/10.1111/j.1741-6612.2004.00035.x

http://dx.doi.org.ezproxy.is.ed.ac.uk/10.1017/S0144686X14000129


http://dx.doi.org.ezproxy.is.ed.ac.uk/10.1007/s11205-019-02104-0


https://doi.org/10.1093/oxfordhb/9780199934874.013.0003


Sewdas, R., de Wind, A., van der Zwaan, L. G. L., van der Borg, W. E., Steenbeek, R.,


https://repository.library.georgetown.edu/handle/10822/1043977


Silverstein, M., Cong, Z., & Li, S. (2006b). Intergenerational transfers and living arrangements of older people in rural China: Consequences for psychological


Srinivasan, T. (1994). Human Development: A New Paradigm or Reinvention of the


http://dx.doi.org.ezproxy.is.ed.ac.uk/10.1017/S004727941300055X


https://doi.org/10.1177/0733464803022002004


Sun, J. (2017). The economic income and intergenerational economic support of the elderly in urban and rural areas in China （中国城乡老年人的经济收入及代际经济支持）. *Population Research, 1*, 34–45.


https://doi.org/10.1177/0164027502243003

Sun, S., & Chen, F. (2017). Women's employment trajectories during early adulthood
https://doi.org/10.1016/j.ssresearch.2017.09.005


Tan, L., & Yang, H. (2013). Why do they require retirement at the same age as men? -Analysis based on the data from the third survey of Chinese women’s social status （她们缘何要求与男性同龄退休?-基于第三期中国妇女社会地位调查数据的分析）. *Collection of Women’s Studies, 2, 12–18.*


https://doi.org/10.1080/13607863.2019.1602589

https://doi.org/10.1007/978-3-319-06459-8_1


https://doi.org/10.1080/13607863.2013.837143


Wang, Y., Li, Y., Huang, Y., Yi, C., & Ren, J. (2020). Housing wealth inequality in China:
An urban-rural comparison. *Cities, 96*, 102428.

https://doi.org/10.1016/j.cities.2019.102428


https://doi.org/10.1080/17439760802303002


311


Wong, & P. Brey (Eds.), *Well-Being in Contemporary Society* (pp. 17–38).
Springer International Publishing. https://doi.org/10.1007/978-3-319-06459-8_2


Xu, L. (2015b). Analysis and Research on the Socio-Economic Status of Older Women in Shanxi Province—Analysis Based on Data from the Third China Women’s
Social Status Survey in Shanxi Province (山西省老年妇女社会经济现状的分析与研究—基于山西省第三次中国妇女社会地位调查数据的分析).


Yang, D. (2016). Problems after the merger of the pension insurance for urban and rural residents (城乡居民养老保险并轨后存在的问题). *Cooperative Economy and Technology*, 2016 年 04, 186–188.


Yang, J. (2018). *A study on poverty and social support for older women in rural areas* (农村老年妇女贫困状况与社会支持研究) [Master’s Thesis]. Guizhou
University of Finance and Economics.


https://doi.org/10.1016/j.socscimed.2004.05.001


https://doi.org/10.1057/9781137435149_7


*Population and Development, 5*, 10.


*Population and Development, 5*, 10.


environment fit theory.


https://doi.org/10.3390/su11072090


http://dx.doi.org.ezproxy.is.ed.ac.uk/10.1080/1331677X.2020.1720769

Appendix

A3-1 The age and sex structure of CHARLS sample

Table 4 Number and age/sex structure of individuals

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total</th>
<th>Gender</th>
<th>Hukou</th>
<th>Residence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Urban</td>
</tr>
<tr>
<td>-50</td>
<td>25.77</td>
<td>23.42</td>
<td>27.91</td>
<td>23.79</td>
</tr>
<tr>
<td>51-55</td>
<td>15.49</td>
<td>16.00</td>
<td>15.02</td>
<td>14.06</td>
</tr>
<tr>
<td>56-60</td>
<td>19.00</td>
<td>19.32</td>
<td>18.69</td>
<td>18.68</td>
</tr>
<tr>
<td>66-70</td>
<td>9.62</td>
<td>10.20</td>
<td>9.08</td>
<td>9.82</td>
</tr>
<tr>
<td>71-75</td>
<td>7.17</td>
<td>7.84</td>
<td>6.56</td>
<td>9.51</td>
</tr>
<tr>
<td>76-80</td>
<td>4.67</td>
<td>4.73</td>
<td>4.61</td>
<td>5.32</td>
</tr>
<tr>
<td>80+</td>
<td>4.41</td>
<td>3.71</td>
<td>5.05</td>
<td>4.69</td>
</tr>
<tr>
<td>OBS</td>
<td>17,587</td>
<td>8,436</td>
<td>9,151</td>
<td>3,872</td>
</tr>
</tbody>
</table>

Individuals without age, gender, or hukou information are excluded from this table.

Source: (Zhao et al. 2013)

A4-1 14 common chronic diseases

DA007. Have you been diagnosed with [conditions listed below, read one by one] by a doctor? 是否有医生曾经告诉过您有以下这些慢性病？

[IWER: Read one by one. 1=yes, 2=no. 访问员注意：请逐项读出以下答案，并让受访者逐一回答，1=是，2=否。]

(1) Hypertension 高血压病
(2) Dyslipidemia (elevation of low density lipoprotein, triglycerides (TGs), and total cholesterol, or a low high density lipoprotein level) 血脂异常（包括低密度脂蛋白、甘油三酯、总胆固醇的升高或（和）高密度脂蛋白的下降）
(3) Diabetes or high blood sugar 糖尿病或血糖升高（包括糖耐量异常和空腹血糖升高）
(4) Cancer or malignant tumor (excluding minor skin cancers) 癌症等恶性肿瘤（不包括轻度皮肤癌）
(5) Chronic lung diseases, such as chronic bronchitis, emphysema (excluding tumors, or cancer) 慢性肺部疾患如慢性支气管炎或肺气肿、肺心病（不包括肿瘤或癌）
(6) Liver disease (except fatty liver, tumors, and cancer) 肝脏疾病（除脂肪肝、肿瘤或癌外）
(7) Heart attack, coronary heart disease, angina, congestive heart failure, or other heart problems 心脏病（如心肌梗塞、冠心病、心绞痛、充血性心力衰
A4-2 10-item version of the Center for Epidemiologic Studies Depression Scale (CES-D Scale)

The 10 items below refer to how you have felt and behaved during the last week.
Choose the appropriate response. 下面10道问题是有关您上周的感觉及行为，每道题目的答案都是一样的，如卡片12所示，包括很少或者根本，不太多，有时或者说有一半的时间还是大多数的时间，请您选择合适的答案。

DC009. I was bothered by things that don't usually bother me. 我因一些小事而烦恼。
   (1) Rarely or none of the time (<1 day) 很少或者根本没有 (<1 天)
   (2) Some or a little of the time (1-2 days) 不太多 (1-2 天)
   (3) Occasionally or a moderate amount of the time (3-4 days) 有时或者说有一半的时间 (3-4 天)
   (4) Most or all of the time (5-7 days) 大多数的时间 (5-7 天)

DC010. I had trouble keeping my mind on what I was doing. 我在做事时很难集中精力。
   (1) Rarely or none of the time (<1 day) 很少或者根本没有 (<1 天)
   (2) Some or a little of the time (1-2 days) 不太多 (1-2 天)
   (3) Occasionally or a moderate amount of the time (3-4 days) 有时或者说有一半的时间 (3-4 天)
   (4) Most or all of the time (5-7 days) 大多数的时间 (5-7 天)

DC011. I felt depressed. 我感到情绪低落。
   (1) Rarely or none of the time (<1 day) 很少或者根本没有 (<1 天)
   (2) Some or a little of the time (1-2 days) 不太多 (1-2 天)
   (3) Occasionally or a moderate amount of the time (3-4 days) 有时或者说有一半的时间 (3-4 天)
   (4) Most or all of the time (5-7 days) 大多数的时间 (5-7 天)
DC012. I felt everything I did was an effort. 我觉得做任何事都很费劲。
(1) Rarely or none of the time (<1 day) 很少或者根本没有（<1天）
(2) Some or a little of the time (1-2 days) 不太多（1-2天）
(3) Occasionally or a moderate amount of the time (3-4 days) 有时或者说有一半的时间（3-4天）
(4) Most or all of the time (5-7 days) 大多数的时间（5-7天）

DC013. I felt hopeful about the future. 我对未来充满希望。
(1) Rarely or none of the time (<1 day) 很少或者根本没有（<1天）
(2) Some or a little of the time (1-2 days) 不太多（1-2天）
(3) Occasionally or a moderate amount of the time (3-4 days) 有时或者说有一半的时间（3-4天）
(4) Most or all of the time (5-7 days) 大多数的时间（5-7天）

DC014. I felt fearful. 我感到害怕。
(1) Rarely or none of the time (<1 day) 很少或者根本没有（<1天）
(2) Some or a little of the time (1-2 days) 不太多（1-2天）
(3) Occasionally or a moderate amount of the time (3-4 days) 有时或者说有一半的时间（3-4天）
(4) Most or all of the time (5-7 days) 大多数的时间（5-7天）

DC015. My sleep was restless. 我的睡眠不好。
(1) Rarely or none of the time (<1 day) 很少或者根本没有（<1天）
(2) Some or a little of the time (1-2 days) 不太多（1-2天）
(3) Occasionally or a moderate amount of the time (3-4 days) 有时或者说有一半的时间（3-4天）
(4) Most or all of the time (5-7 days) 大多数的时间（5-7天）

DC016. I was happy. 我很愉快。
(1) Rarely or none of the time (<1 day) 很少或者根本没有（<1天）
(2) Some or a little of the time (1-2 days) 不太多（1-2天）
(3) Occasionally or a moderate amount of the time (3-4 days) 有时或者说有一半的时间（3-4天）
(4) Most or all of the time (5-7 days) 大多数的时间（5-7天）

DC017. I felt lonely. 我感到孤独。
(1) Rarely or none of the time (<1 day) 很少或者根本没有（<1天）
(2) Some or a little of the time (1-2 days) 不太多（1-2天）
(3) Occasionally or a moderate amount of the time (3-4 days) 有时或者说有一半的时间（3-4天）
(4) Most or all of the time (5-7 days) 大多数的时间（5-7天）

DC018. I could not get "going." 我觉得我无法继续我的生活。
(1) Rarely or none of the time (<1 day) 很少或者根本没有 (< 1 天)
(2) Some or a little of the time (1-2 days) 不太多 (1 - 2 天)
(3) Occasionally or a moderate amount of the time (3-4 days) 有时或者说 有一半的时间 (3-4 天)
(4) Most or all of the time (5-7 days) 大多数的时间 (5-7 天)
A4-3 Highest level of education

**BD001. What is the highest level of education you have attained?** 您获得的最高学历是？

(1) No formal education (illiterate) 未受过教育（文盲） → Skip to BD007 请跳至 BD007
(2) Did not finish primary school but capable of reading and/or writing 未读完小学，但能够读、写
(3) Sishu/home school 私塾
(4) Elementary school 小学毕业
(5) Middle school 初中毕业
(6) High school 高中毕业
(7) Vocational school 中专（包括中等师范、职高）毕业
(8) Two-/Three-Year College/Associate degree 大专毕业
(9) Four-Year College/Bachelor's degree 本科毕业
(10) Master's degree 硕士毕业
(11) Doctoral degree/Ph.D. 博士毕业
A5-1 Comparing me, the official CHARLS and Gateway to Global Aging constructs for the total household income variable

<table>
<thead>
<tr>
<th></th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>I constructed</td>
<td>14,815</td>
<td>30,491.83</td>
<td>63,927.33</td>
<td>-1,748,000</td>
<td>2,620,400</td>
</tr>
<tr>
<td>Gateway to Global Aging</td>
<td>14,815</td>
<td>30,491.83</td>
<td>63,927.33</td>
<td>-1,748,000</td>
<td>2,620,400</td>
</tr>
<tr>
<td>CHARLS</td>
<td>17,355</td>
<td>38,512.41</td>
<td>80,153.77</td>
<td>-1,749,000</td>
<td>2,626,400</td>
</tr>
</tbody>
</table>

Source: Author constructed based on CHARLS and harmonized CHARLS.

A5-2 Income variables generation process

The income module asks respondents’ total amount of wage and bonus, other income and subsidies, but in the work module, the respondent is asked more detailed questions about their work, received subsidies, investment and other work and the related incomes. After calculation, most net incomes for each person from these two parts are the same, but some of them are different, and the missing values of individual’s net income from working module are less than the missing values of individual’s net income from income module (see Appendix, Table A). It may due to the respondents’ memory mistakes when asking about an overall income, people may remember unclearly, but when they ask for their income based on their working, they often may remember quite clearly. Thus, in order not to double calculate the income data, the maximum income from these two modules is chose to be the final individual’s income. Using the maximum income as the final individual’s income is a way that Harmonized CHARLS data used. This dataset is created by GATEWAY TO GLOBAL AGING DATA (Gateway to Global Aging Data, 2018), which aims at comparing CHARLS with other datasets, such as Harmonized English Longitudinal Study of Ageing, Harmonized Survey of Health, Ageing, and Retirement in Europe, etc. Details about how to construct the income groups are list below. All of the questions showed in italics are taken directly from the CHARLS Questionnaire.
In the income module, respondents were asked to report their wages and bonus income in the past year. The questions are as below:

Did you receive any wage and bonus income in the past year?

Responses:
- Yes
- No
- Missing

Respondents who indicate that they do not receive any wages or bonus income in the past year were not asked the value of the income question and were assigned a value of 0. If they answer yes to received wages and bonus, then they were also asked the total amount of these type of income.

How much did you receive last year (after tax and housing costs)?
- Yuan per year
- Yuan per month
- Missing

Respondents can report wage and bonus income in two ways: annually or monthly. The total amount of income in the income module is derived from first using the reported annual amount. If the annual amount is missing, then this amount is based on the monthly amount times 12, this calculation also refers to the way that the Harmonized CHARLS data used. Here, CHALRS does not provide the numbers of months that the respondent received a wage. Thus, 12 months are calculated into the monthly wage as it assumes that people worked for 12 months last year. Indeed, there could be a limitation that this calculation could generalise bias as some people may not work for 12 months. However, the final individual net incomes are not only based on the income module; they also based on the working module; in this module, working months are presented. Thus, after the final calculation, the bias
Apart from being asked questions about the wage and bonus, respondents also need to answer questions about other sources of income, such as pensions, subsidies, other income sources, and so on. All these incomes are total together to be part of the individual income.

Did you receive any of the following types of individual income in the past year? (check all that apply)
- Pensions
- Unemployment compensation
- Pension subsidy
- Workers’ compensation
- Elderly family planning subsidies
- Medical aid
- Other government subsidies
- Social assistance
- Other income sources
- None of the above
- Missing

Thus, the individual income from the income module is consists of two parts, which are wage, bonus and other sources of income.

In the work module, respondents were asked to report their wages from agricultural work, non-agricultural job, side job, and all other bonuses. The person who works for other farmers were required to report their average monthly wage; for this part, the total income a person earns is the average monthly wage times the month that they have engaged into the work.

*What is the average monthly wage did you get in your working months in the*
past year (after tax and housing costs)?
- Yuan per month
- Missing

The calculation of income from non-agriculture work is consists of two parts; one is from working salary, the other is the fringe benefits which are provided by the working institutions. In CHARLS, respondents were asked about the after taxes wages by year/month/weekly/day/hours, and the received fringe benefits by estimating the values of these fringe benefits. Similar to the calculation of the income above (see page 2), if annual wages are missing, then it is replaced by monthly, weekly, daily or hourly wages times the corresponding number of their working times. The fringe benefits are free meals, including lunch, breakfast, dinner or meal cash subsidy; transportation cash subsidisations or free shuttle bus; free housing or subsidisation of housing.

Because the above fringe benefits are not included in pension income, this type of income needs to be calculated separately. CHARLS asks a question about pension income by confirming pension receiving status and reporting monthly pension income. Thus, the annual total pension income is according to the monthly pension income times 12 (pension is allocated by the government, and the total amount that people received is the 12 months total pension (T. Chen & Turner, 2015)).

Income from side jobs, investment and self-employment, are also added to the final individual income. In each part, if a person reported he/she did not receive these types of incomes is recorded as 0, otherwise, if she/ he did report the income from these parts is coded as missing values.

The income from the work module is the total amount of income from agricultural work, non-agricultural job, side job, and all other bonuses. Then, the final individual income is the maximum of these two parts of income, income from the income
module and the income from the work module, as mentioned at the beginning of this section.

CHARLS measures household income from both an individual level and household level. CHARLS data includes the information of both respondents and their spouses’ income situation as well as other household members; thus, the total household income from individual level is the total amount of their income. From household level, household income includes income from household agriculture work, income from household self-employment business, government transfer at a household level, income from financial assets and non-financial assets.

The income of household agriculture work includes income from two different types of agricultural work. There are crops and forestry products, livestock and fisheries. The CHARLS data provided the information on the total values that products produced in the past year, the values that the house consumed and the total cost of producing products. Thus, the net income of household agricultural work is using the entire profits that products produced in the past year minus the values that the house consumed, and then minus the total cost of producing products.

The income of household self-employment business also shares the same calculation as above, that is, using the total amount that last year earnings minus the overall costs. The income from financial assets is the interest that is received from the money that was lent to others in the household level, the income from non-financial assets includes the annual rental income for all rooms or houses that are currently leased, rental income from cultivated land, forest land, pasture and pond.
### A5-3 Sensitivity check on longitudinal weights

Table A5-3-1: The relationship between living arrangements and well-being among rural women aged 60 and over (from living with spouse to other types) (fixed effects model) (unweighted)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Overall well-being</th>
<th>Physical well-being</th>
<th>Economic well-being</th>
<th>Mental well-being</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Living arrangement (reference group: living with spouse)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living alone</td>
<td>0.036**</td>
<td>0.015</td>
<td>-0.056**</td>
<td>0.102***</td>
</tr>
<tr>
<td></td>
<td>(2.24)</td>
<td>(0.84)</td>
<td>(-2.39)</td>
<td>(3.07)</td>
</tr>
<tr>
<td>Living with children</td>
<td>0.063**</td>
<td>0.047**</td>
<td>0.008</td>
<td>0.104*</td>
</tr>
<tr>
<td></td>
<td>(3.53)</td>
<td>(2.35)</td>
<td>(0.30)</td>
<td>(2.79)</td>
</tr>
<tr>
<td>Living with spouse and children</td>
<td>0.021</td>
<td>0.003</td>
<td>0.018</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td>(1.67)</td>
<td>(0.20)</td>
<td>(0.98)</td>
<td>(1.33)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.015</td>
<td>0.006</td>
<td>-0.010</td>
<td>0.015</td>
</tr>
<tr>
<td></td>
<td>(-1.24)</td>
<td>(0.42)</td>
<td>(-0.63)</td>
<td>(0.62)</td>
</tr>
<tr>
<td>Age square</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(-0.62)</td>
<td>(-0.58)</td>
<td>(-0.04)</td>
<td>(-0.07)</td>
</tr>
<tr>
<td><strong>Financial support from non-coreident adult children (reference group: No)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-0.019***</td>
<td>0.008</td>
<td>-0.015</td>
<td>-0.048***</td>
</tr>
<tr>
<td></td>
<td>(-2.61)</td>
<td>(0.99)</td>
<td>(-1.39)</td>
<td>(-3.29)</td>
</tr>
<tr>
<td><strong>Instrument support from non-coreident adult children (reference group: No)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-0.005</td>
<td>-0.018**</td>
<td>-0.012</td>
<td>-0.018</td>
</tr>
<tr>
<td></td>
<td>(-0.64)</td>
<td>(-1.98)</td>
<td>(-1.04)</td>
<td>(-1.12)</td>
</tr>
<tr>
<td><strong>Emotion support from non-coreident adult children (reference group: No)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.017*</td>
<td>-0.002</td>
<td>0.018</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td>(1.69)</td>
<td>(-0.17)</td>
<td>(1.18)</td>
<td>(1.59)</td>
</tr>
<tr>
<td>Numbers of adult household members</td>
<td>-0.001</td>
<td>0.002</td>
<td>-0.002</td>
<td>-0.008*</td>
</tr>
<tr>
<td></td>
<td>(-0.57)</td>
<td>(0.67)</td>
<td>(-0.56)</td>
<td>(-1.58)</td>
</tr>
<tr>
<td>Numbers of grandchildren in the households</td>
<td>0.107***</td>
<td>-0.071***</td>
<td>0.069**</td>
<td>0.091**</td>
</tr>
<tr>
<td></td>
<td>(3.42)</td>
<td>(-2.17)</td>
<td>(1.15)</td>
<td>(1.38)</td>
</tr>
</tbody>
</table>
### Numbers of adult children live nearby

<table>
<thead>
<tr>
<th></th>
<th>0.001</th>
<th>0.002</th>
<th>0.006</th>
<th>-0.004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0.25)</td>
<td>(0.56)</td>
<td>(1.03)</td>
<td>(-0.45)</td>
</tr>
</tbody>
</table>

#### Total household income level (reference group: Bottom quintile)

<table>
<thead>
<tr>
<th>Quintile</th>
<th>Coefficient 1</th>
<th>Coefficient 2</th>
<th>Coefficient 3</th>
<th>Coefficient 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second lowest quintile</td>
<td>-0.013</td>
<td>-0.007</td>
<td>-0.001</td>
<td>-0.032*</td>
</tr>
<tr>
<td></td>
<td>(-1.43)</td>
<td>(-0.74)</td>
<td>(-0.10)</td>
<td>(-1.73)</td>
</tr>
<tr>
<td>Middle quintile</td>
<td>-0.014</td>
<td>-0.025**</td>
<td>0.010</td>
<td>-0.036*</td>
</tr>
<tr>
<td></td>
<td>(-1.45)</td>
<td>(-2.32)</td>
<td>(0.71)</td>
<td>(-1.81)</td>
</tr>
<tr>
<td>Second highest quintile</td>
<td>-0.013</td>
<td>-0.017</td>
<td>0.015</td>
<td>-0.044*</td>
</tr>
<tr>
<td></td>
<td>(-1.17)</td>
<td>(-1.37)</td>
<td>(0.93)</td>
<td>(-1.95)</td>
</tr>
<tr>
<td>Top quintile</td>
<td>-0.018</td>
<td>-0.016</td>
<td>0.022</td>
<td>-0.068***</td>
</tr>
<tr>
<td></td>
<td>(-1.41)</td>
<td>(-1.09)</td>
<td>(1.13)</td>
<td>(-2.58)</td>
</tr>
<tr>
<td>Missing</td>
<td>-0.003</td>
<td>0.011</td>
<td>0.010</td>
<td>-0.053***</td>
</tr>
<tr>
<td></td>
<td>(-0.37)</td>
<td>(1.13)</td>
<td>(0.82)</td>
<td>(-2.91)</td>
</tr>
<tr>
<td>Constant</td>
<td>1.128*</td>
<td>0.489</td>
<td>0.969</td>
<td>1.391</td>
</tr>
<tr>
<td></td>
<td>(2.59)</td>
<td>(1.02)</td>
<td>(1.76)</td>
<td>(1.55)</td>
</tr>
<tr>
<td>Observations</td>
<td>4,079</td>
<td>4,412</td>
<td>4,956</td>
<td>4,500</td>
</tr>
<tr>
<td>R-squared: within</td>
<td>0.072</td>
<td>0.086</td>
<td>0.070</td>
<td>0.134</td>
</tr>
<tr>
<td>Number of individuals</td>
<td>1,654</td>
<td>1,694</td>
<td>1,772</td>
<td>1,735</td>
</tr>
</tbody>
</table>

5. Robust t-statistics in parentheses
6. *** p<0.01, ** p<0.05, * p<0.1
7. Likelihood ratio test:
   a. Overall well-being: F (16,2409) = 4.81; Prob > F = 0.0000
   b. Physical well-being: F (16,2702) = 2.67; Prob > F = 0.0000
   c. Economic well-being: F (16,3168) = 4.12; Prob > F = 0.0000
   d. Mental well-being: F (16,2749) = 6.01; Prob > F = 0.0000
8. Hausman test:
   a. Overall well-being: Prob>chi2 = 0.0000
   b. Physical well-being: Prob>chi2 = 0.0000
   c. Economic well-being: Prob>chi2 = 0.0000
   d. Mental well-being: Prob>chi2 = 0.0000
Table A5-3-2 The relationship between living arrangements and well-being among urban women aged 60 years and over (from living with spouse to other types) (fixed effects model) (unweighted)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Overall well-being</th>
<th>Physical well-being</th>
<th>Economic well-being</th>
<th>Mental well-being</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living arrangement (reference group: living with spouse)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living alone</td>
<td>0.009</td>
<td>0.025</td>
<td>-0.054</td>
<td>0.055</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(1.12)</td>
<td>(-1.92)</td>
<td>(1.37)</td>
</tr>
<tr>
<td>Living with children</td>
<td>-0.022</td>
<td>-0.058</td>
<td>-0.026</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>(-0.85)</td>
<td>(-0.97)</td>
<td>(-0.71)</td>
<td>(0.21)</td>
</tr>
<tr>
<td>Living with spouse and children</td>
<td>-0.022</td>
<td>-0.012</td>
<td>-0.038</td>
<td>0.048</td>
</tr>
<tr>
<td></td>
<td>(-1.10)</td>
<td>(-0.53)</td>
<td>(-1.34)</td>
<td>(1.20)</td>
</tr>
<tr>
<td>Age</td>
<td>0.007</td>
<td>0.042**</td>
<td>0.002</td>
<td>-0.017</td>
</tr>
<tr>
<td></td>
<td>(0.46)</td>
<td>(2.36)</td>
<td>(0.08)</td>
<td>(-0.55)</td>
</tr>
<tr>
<td>Age square</td>
<td>-0.000</td>
<td>-0.000**</td>
<td>-0.000</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(-0.79)</td>
<td>(-2.10)</td>
<td>(-0.24)</td>
<td>(0.14)</td>
</tr>
<tr>
<td>Financial support from non-coresident adult children (reference group: No)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.001</td>
<td>0.012</td>
<td>-0.030***</td>
<td>-0.025</td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
<td>(1.37)</td>
<td>(-2.64)</td>
<td>(-1.52)</td>
</tr>
<tr>
<td>Instrument support from non-coresident adult children (reference group: No)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-0.000</td>
<td>0.020</td>
<td>0.001</td>
<td>-0.019*</td>
</tr>
<tr>
<td></td>
<td>(-0.01)</td>
<td>(1.82)</td>
<td>(0.06)</td>
<td>(-0.94)</td>
</tr>
<tr>
<td>Emotion support from non-coresident adult children (reference group: No)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-0.003</td>
<td>-0.005</td>
<td>-0.024</td>
<td>0.062</td>
</tr>
<tr>
<td></td>
<td>(-0.15)</td>
<td>(-0.27)</td>
<td>(-1.01)</td>
<td>(1.78)</td>
</tr>
<tr>
<td>Numbers of adult household members</td>
<td>-0.008**</td>
<td>-0.002</td>
<td>-0.005</td>
<td>-0.010*</td>
</tr>
<tr>
<td></td>
<td>(-2.52)</td>
<td>(-0.59)</td>
<td>(-1.06)</td>
<td>(-1.48)</td>
</tr>
<tr>
<td>Numbers of grandchildren in the households</td>
<td>0.095**</td>
<td>0.001*</td>
<td>0.079**</td>
<td>-0.024**</td>
</tr>
<tr>
<td></td>
<td>(0.70)</td>
<td>(0.19)</td>
<td>(0.97)</td>
<td>(-0.34)</td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>Standard Error</td>
<td>z-value</td>
<td>p-value</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------</td>
<td>----------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Numbers of adult children live nearby</td>
<td>-0.008</td>
<td>-0.003</td>
<td>0.002</td>
<td>-0.011</td>
</tr>
<tr>
<td></td>
<td>(-1.40)</td>
<td>(-0.57)</td>
<td>(0.31)</td>
<td>(-1.06)</td>
</tr>
<tr>
<td><strong>Total household income level (reference group: Bottom quintile)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second lowest quintile</td>
<td>-0.008</td>
<td>0.004</td>
<td>-0.003</td>
<td>-0.028</td>
</tr>
<tr>
<td></td>
<td>(-0.72)</td>
<td>(0.34)</td>
<td>(-0.21)</td>
<td>(-1.22)</td>
</tr>
<tr>
<td>Middle quintile</td>
<td>-0.031**</td>
<td>-0.011</td>
<td>-0.013</td>
<td>-0.051**</td>
</tr>
<tr>
<td></td>
<td>(-2.51)</td>
<td>(-0.79)</td>
<td>(-0.70)</td>
<td>(-2.04)</td>
</tr>
<tr>
<td>Second highest quintile</td>
<td>-0.022</td>
<td>-0.014</td>
<td>-0.006</td>
<td>-0.043</td>
</tr>
<tr>
<td></td>
<td>(-1.65)</td>
<td>(-0.93)</td>
<td>(-0.30)</td>
<td>(-1.61)</td>
</tr>
<tr>
<td>Top quintile</td>
<td>-0.017</td>
<td>0.027</td>
<td>0.001</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>(-1.18)</td>
<td>(1.60)</td>
<td>(0.05)</td>
<td>(-0.07)</td>
</tr>
<tr>
<td>Missing</td>
<td>0.002</td>
<td>0.004</td>
<td>-0.003</td>
<td>-0.009</td>
</tr>
<tr>
<td></td>
<td>(0.18)</td>
<td>(0.31)</td>
<td>(-0.23)</td>
<td>(-0.46)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.224</td>
<td>-1.308**</td>
<td>0.430</td>
<td>1.394</td>
</tr>
<tr>
<td></td>
<td>(0.40)</td>
<td>(-2.05)</td>
<td>(0.59)</td>
<td>(1.27)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,260</td>
<td>2,442</td>
<td>2,687</td>
<td>2,489</td>
</tr>
<tr>
<td>R-squared: within</td>
<td>0.062</td>
<td>0.052</td>
<td>0.075</td>
<td>0.091</td>
</tr>
<tr>
<td>Number of individuals</td>
<td>943</td>
<td>965</td>
<td>1,003</td>
<td>985</td>
</tr>
</tbody>
</table>

5. Robust t-statistics in parentheses

6. *** p<0.01, ** p<0.05, * p<0.1

7. Likelihood ratio test:
   a. Overall well-being: F (16,1301) =1.85; Prob > F = 0.0109
   b. physical well-being: F (16,1461) =2.06; Prob > F = 0.0021
   c. Economic well-being: F (16,1668) =1.48; Prob > F = 0.0080
   d. Mental well-being: F (16,1488) =3.01; Prob > F = 0.0001

8. Hausman test:
   a. Overall well-being: Prob>chi2 = 0.0000
   b. physical well-being: Prob>chi2 = 0.0000
   c. Economic well-being: Prob>chi2 = 0.0000
   d. Mental well-being: Prob>chi2 = 0.0000
## A6-1 Sensitivity check on cross-sectional weights

Table A6-1-1 The relationship between living arrangements and well-being of women aged 60 and over

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living alone vs Living with spouse (ref.)</td>
<td>-0.052***</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>(-2.75)</td>
<td>(0.44)</td>
</tr>
<tr>
<td>Living with children vs Living with spouse (ref.)</td>
<td>-0.016</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(-0.63)</td>
<td>(-0.12)</td>
</tr>
<tr>
<td>Living with spouse and children vs Living with spouse (ref.)</td>
<td>-0.007</td>
<td>-0.021**</td>
</tr>
<tr>
<td></td>
<td>(-0.27)</td>
<td>(-0.72)</td>
</tr>
<tr>
<td>Living with children vs. Living alone (ref.)</td>
<td>0.046**</td>
<td>-0.013</td>
</tr>
<tr>
<td></td>
<td>(1.25)</td>
<td>(-0.38)</td>
</tr>
<tr>
<td>Living with spouse and children vs. Living alone (ref.)</td>
<td>0.076**</td>
<td>-0.080**</td>
</tr>
<tr>
<td></td>
<td>(1.50)</td>
<td>(-0.83)</td>
</tr>
<tr>
<td>Living with children vs. Living with spouse and children (ref.)</td>
<td>-0.009</td>
<td>0.047**</td>
</tr>
<tr>
<td></td>
<td>(-0.49)</td>
<td>(0.79)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.008</td>
<td>-0.035</td>
</tr>
<tr>
<td></td>
<td>(-0.56)</td>
<td>(-2.17)</td>
</tr>
<tr>
<td>Age square</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(1.78)</td>
</tr>
</tbody>
</table>

**Education level (reference group: Illiterate)**

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<thead>
<tr>
<th>Variables</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can read or write</td>
<td>-0.010</td>
<td>-0.043</td>
</tr>
<tr>
<td></td>
<td>(-0.65)</td>
<td>(-2.28)</td>
</tr>
<tr>
<td>Primary school</td>
<td>-0.003</td>
<td>-0.049</td>
</tr>
<tr>
<td></td>
<td>(-0.21)</td>
<td>(-2.72)</td>
</tr>
<tr>
<td>Secondary school or above</td>
<td>-0.108</td>
<td>-0.110</td>
</tr>
<tr>
<td></td>
<td>(-3.50)</td>
<td>(-6.05)</td>
</tr>
<tr>
<td>Living arrangements preferences (reference group: Live with adult children)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Live in the same community/village</td>
<td>0.007</td>
<td>-0.001</td>
</tr>
<tr>
<td>(0.56)</td>
<td>(-0.05)</td>
<td></td>
</tr>
<tr>
<td>Neither in the same house nor the same community/village</td>
<td>0.003</td>
<td>-0.016</td>
</tr>
<tr>
<td>(0.11)</td>
<td>(-0.46)</td>
<td></td>
</tr>
<tr>
<td>Live in a nursing house</td>
<td>0.122***</td>
<td>0.027</td>
</tr>
<tr>
<td>(2.75)</td>
<td>(0.74)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>-0.042</td>
<td>0.016</td>
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<tr>
<td>(-0.65)</td>
<td>(0.35)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Financial support from non-coresident adult children (reference group: No)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>-0.018*</td>
<td>-0.013</td>
</tr>
<tr>
<td>(-1.47)</td>
<td>(-1.02)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instrument support from non-coresident adult children (reference group: No)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>-0.053***</td>
<td>-0.025*</td>
</tr>
<tr>
<td>(-3.43)</td>
<td>(-0.92)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Emotion support from non-coresident adult children (reference group: No)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>0.002</td>
<td>-0.069***</td>
</tr>
<tr>
<td>(0.09)</td>
<td>(-2.83)</td>
<td></td>
</tr>
<tr>
<td>Numbers of adult household members</td>
<td>-0.019***</td>
<td>-0.008</td>
</tr>
<tr>
<td>(-3.22)</td>
<td>(-0.97)</td>
<td></td>
</tr>
<tr>
<td>Numbers of grandchildren in the households</td>
<td>0.022***</td>
<td>0.011**</td>
</tr>
<tr>
<td>(2.97)</td>
<td>(0.13)</td>
<td></td>
</tr>
<tr>
<td>Numbers of adult children live nearby</td>
<td>-0.008**</td>
<td>0.009**</td>
</tr>
<tr>
<td>(-2.09)</td>
<td>(2.02)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total household income level (reference group: Bottom quintile)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Second lowest quintile</td>
<td>0.038</td>
<td>-0.056</td>
</tr>
<tr>
<td>(2.30)</td>
<td>(-2.78)</td>
<td></td>
</tr>
<tr>
<td>Middle quintile</td>
<td>0.025</td>
<td>-0.071</td>
</tr>
<tr>
<td>(1.41)</td>
<td>(-3.14)</td>
<td></td>
</tr>
<tr>
<td>Second highest quintile</td>
<td>-0.027**</td>
<td>-0.113***</td>
</tr>
<tr>
<td>(-0.84)</td>
<td>(-5.21)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Top quintile</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td>-0.039*</td>
<td>-0.134***</td>
</tr>
<tr>
<td></td>
<td>(-1.76)</td>
<td>(-5.62)</td>
</tr>
<tr>
<td>**p&lt;0.05,  * p&lt;0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Robust z-statistics in parentheses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p&lt;0.01</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Authors’ own computation*
### A7-1 Sensitivity check on cross-sectional weights

Table A7-1-1 Relationship between women aged 60 and over’s share of household income and their subjective economic well-being under different living arrangements (by urban and rural areas) (weighted)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Rural</th>
<th></th>
<th>Urban</th>
<th></th>
<th>Living with a spouse and adult children</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Living with a spouse</td>
<td>(OR)</td>
<td>Living with adult children</td>
<td>(OR)</td>
<td>Living with a spouse and adult children</td>
<td>(OR)</td>
</tr>
<tr>
<td>Share of household labour income</td>
<td>1.016**</td>
<td>(1.56)</td>
<td>0.996</td>
<td>(-0.76)</td>
<td>0.996</td>
<td>(-1.09)</td>
</tr>
<tr>
<td></td>
<td>(1.22)</td>
<td>(-0.34)</td>
<td>1.002</td>
<td>0.997</td>
<td>1.000</td>
<td>0.12</td>
</tr>
<tr>
<td>Age</td>
<td>0.731</td>
<td>(-1.26)</td>
<td>1.504</td>
<td>0.944</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.22)</td>
<td>(1.20)</td>
<td>(-1.17)</td>
<td>(0.12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age square</td>
<td>0.731</td>
<td>(-1.26)</td>
<td>1.504</td>
<td>0.944</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.22)</td>
<td>(1.20)</td>
<td>(-1.17)</td>
<td>(0.12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education level (reference group: Illiterate)</td>
<td>1.056</td>
<td>(0.25)</td>
<td>1.165</td>
<td>(0.38)</td>
<td>0.773</td>
<td>(-1.03)</td>
</tr>
<tr>
<td>Can read or write</td>
<td>(0.76)</td>
<td>(0.25)</td>
<td>1.165</td>
<td>(0.38)</td>
<td>0.773</td>
<td>(-1.03)</td>
</tr>
<tr>
<td>Primary school</td>
<td>0.923</td>
<td>(-0.34)</td>
<td>1.055</td>
<td>0.900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary school or above</td>
<td>1.368</td>
<td>0.925</td>
<td>0.877</td>
<td>0.525</td>
<td>0.925</td>
<td>0.778</td>
</tr>
<tr>
<td></td>
<td>(0.76)</td>
<td>(-0.23)</td>
<td>(-0.08)</td>
<td>(-1.24)</td>
<td>(-0.23)</td>
<td>(-0.59)</td>
</tr>
</tbody>
</table>

Living arrangements preferences (reference group: Live with adult children)
<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Live in the same community/village</td>
<td>1.041</td>
<td>1.256</td>
<td>1.017</td>
<td>1.502*</td>
<td>1.417</td>
<td>1.018</td>
</tr>
<tr>
<td></td>
<td>(0.23)</td>
<td>(0.61)</td>
<td>(0.08)</td>
<td>(1.64)</td>
<td>(0.82)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Neither in the same house nor the</td>
<td>0.951</td>
<td>1.966</td>
<td>0.706</td>
<td>0.866</td>
<td>1.651</td>
<td>0.754</td>
</tr>
<tr>
<td>same community/village</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.14)</td>
<td>(0.73)</td>
<td>(-0.52)</td>
<td>(-0.27)</td>
<td>(0.30)</td>
<td>(-0.48)</td>
</tr>
<tr>
<td>Live in a nursing house</td>
<td>2.183</td>
<td>1.104</td>
<td>2.227</td>
<td>2.408*</td>
<td>1.124</td>
<td>0.549</td>
</tr>
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<td></td>
<td>(0.97)</td>
<td>(0.10)</td>
<td>(1.05)</td>
<td>(1.88)</td>
<td>(1.15)</td>
<td>(-0.66)</td>
</tr>
<tr>
<td>Other</td>
<td>0.408</td>
<td>0.346</td>
<td>0.522</td>
<td>0.760</td>
<td>0.727</td>
<td>0.627</td>
</tr>
<tr>
<td></td>
<td>(-1.09)</td>
<td>(-0.76)</td>
<td>(-0.52)</td>
<td>(-0.39)</td>
<td>(-0.26)</td>
<td>(-0.37)</td>
</tr>
<tr>
<td>Financial support from non-coresident adult children (reference group: No)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.949</td>
<td>0.728</td>
<td>0.767</td>
<td>0.823</td>
<td>0.424</td>
<td>0.619**</td>
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<td>(-1.10)</td>
<td>(-1.30)</td>
<td>(-0.83)</td>
<td>(-2.08)</td>
<td>(-1.72)</td>
</tr>
<tr>
<td>Instrument support from non-coresident adult children (reference group: No)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.533***</td>
<td>0.116***</td>
<td>0.834**</td>
<td>0.632**</td>
<td>0.364**</td>
<td>0.798*</td>
</tr>
<tr>
<td></td>
<td>(-3.61)</td>
<td>(-2.18)</td>
<td>(-1.95)</td>
<td>(-2.09)</td>
<td>(-2.52)</td>
<td>(-1.73)</td>
</tr>
<tr>
<td>Emotion support from non-coresident adult children (reference group: No)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.806</td>
<td>1.036</td>
<td>0.712</td>
<td>0.569*</td>
<td>1.486</td>
<td>0.699</td>
</tr>
<tr>
<td></td>
<td>(-1.02)</td>
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<td>(-1.38)</td>
<td>(-1.68)</td>
<td>(1.37)</td>
<td>(-0.24)</td>
</tr>
<tr>
<td>Numbers of adult household members</td>
<td>0.930</td>
<td>0.724**</td>
<td>0.933</td>
<td>1.092</td>
<td>0.808*</td>
<td>0.815</td>
</tr>
<tr>
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<td>(-2.38)</td>
<td>(-0.93)</td>
<td>(0.35)</td>
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<td>(-1.58)</td>
</tr>
<tr>
<td>Numbers of grand adult children in the households</td>
<td>0.943</td>
<td>1.096**</td>
<td>1.205*</td>
<td>0.805</td>
<td>1.082**</td>
<td>1.307**</td>
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<tr>
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<td>(-0.41)</td>
<td>(0.60)</td>
<td>(1.75)</td>
<td>(-0.73)</td>
<td>(0.93)</td>
<td>(2.03)</td>
</tr>
<tr>
<td>Numbers of adult children live nearby</td>
<td>0.936</td>
<td>0.853*</td>
<td>1.142</td>
<td>1.081</td>
<td>0.776**</td>
<td>1.233</td>
</tr>
<tr>
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<td>(-1.05)</td>
<td>(-1.82)</td>
<td>(1.95)</td>
<td>(0.93)</td>
<td>(-1.60)</td>
<td>(2.27)</td>
</tr>
<tr>
<td></td>
<td>Second lowest quintile</td>
<td>Middle quintile</td>
<td>Second highest quintile</td>
<td>Top quintile</td>
<td>Missing</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------</td>
<td>----------------</td>
<td>-------------------------</td>
<td>-------------</td>
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<tr>
<td></td>
<td>0.789</td>
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<td>0.398</td>
<td>0.061</td>
<td>0.789</td>
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</tr>
<tr>
<td></td>
<td>(−1.16)</td>
<td>(−2.45)</td>
<td>(−3.10)</td>
<td>(−5.08)</td>
<td>(−1.16)</td>
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</tr>
<tr>
<td></td>
<td>0.680</td>
<td>0.626**</td>
<td>0.474**</td>
<td>0.391***</td>
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<td>(−3.19)</td>
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<td>1.409</td>
<td>0.668**</td>
<td>0.448***</td>
<td>0.373**</td>
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<td>(−1.20)</td>
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<td>0.671</td>
<td>0.955</td>
<td>0.627</td>
<td>0.272</td>
<td>(−1.70)</td>
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<td>(−1.14)</td>
<td>(−0.14)</td>
<td>(−1.34)</td>
<td>(−3.14)</td>
<td>(−1.14)</td>
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<tr>
<td></td>
<td>0.595**</td>
<td>0.424**</td>
<td>0.387**</td>
<td>0.217***</td>
<td>(−2.30)</td>
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<td>(−1.16)</td>
<td>(−1.16)</td>
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<tr>
<td></td>
<td>1.563</td>
<td>0.561**</td>
<td>0.353**</td>
<td>0.224**</td>
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<td>231</td>
<td>468</td>
<td>457</td>
<td>155</td>
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<td>Pseudo R-squared</td>
<td>0.0852</td>
<td>0.0801</td>
<td>0.0369</td>
<td>0.102</td>
<td>0.095</td>
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</tr>
</tbody>
</table>

Robust z-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Table A7-1-2 Relationship between women aged 60 and over’s share of household income and their spouses’ subjective economic well-being under different living arrangements (by urban and rural areas) (weighted)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 7 (OR)</td>
<td>Model 8 (OR)</td>
</tr>
<tr>
<td>Share of household labour income</td>
<td>1.112** (0.73)</td>
<td>0.997 (-0.88)</td>
</tr>
<tr>
<td>Spouse’s age</td>
<td>0.710* (-1.58)</td>
<td>0.739 (-1.15)</td>
</tr>
<tr>
<td>Spouse’s age square</td>
<td>1.002 (1.45)</td>
<td>1.002 (1.07)</td>
</tr>
<tr>
<td>Spouse’s education level (reference group: Illiterate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can read or write</td>
<td>0.879 (-0.52)</td>
<td>0.823 (-0.65)</td>
</tr>
<tr>
<td>Primary school</td>
<td>0.760 (-1.20)</td>
<td>0.471 (-2.77)</td>
</tr>
<tr>
<td>Secondary school or above</td>
<td>0.788** (-0.88)</td>
<td>0.500** (-2.10)</td>
</tr>
<tr>
<td>Spouse’s living arrangements preferences (reference group: Live with adult children)</td>
<td></td>
<td></td>
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<tr>
<td>Live in the same community/village</td>
<td>1.137 (0.73)</td>
<td>1.094 (0.40)</td>
</tr>
<tr>
<td>Neither in the same house nor the same community/village</td>
<td>0.982 (-0.06)</td>
<td>1.179 (0.25)</td>
</tr>
<tr>
<td>Live in a nursing house</td>
<td>0.602 (-0.90)</td>
<td>3.366 (1.89)</td>
</tr>
<tr>
<td>Other</td>
<td>0.415 (-1.10)</td>
<td>1.576 (0.52)</td>
</tr>
<tr>
<td>Financial support from non-coresident adult children (reference group: No)</td>
<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>1.155 (0.82)</td>
<td>1.113 (0.51)</td>
</tr>
<tr>
<td>Instrument support from non-coresident adult children (reference group: No)</td>
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<tr>
<td>Yes</td>
<td>0.532*** (-3.65)</td>
<td>0.554*** (-2.46)</td>
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<td>Emotion support from non-coresident adult children (reference group: No)</td>
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<tr>
<td>Yes</td>
<td>0.692 (-1.77)</td>
<td>0.772 (-0.74)</td>
</tr>
<tr>
<td>Numbers of adult household members</td>
<td>1.011 (0.45)</td>
<td>0.934 (-0.88)</td>
</tr>
<tr>
<td>Numbers of grand adult children in the</td>
<td>1.023 (1.071)</td>
<td>0.905 (0.856)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td>(0.13)</td>
<td>(0.61)</td>
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<tr>
<td>Numbers of adult children live nearby</td>
<td>0.875</td>
<td>1.074</td>
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<tr>
<td></td>
<td>(-2.09)</td>
<td>(1.04)</td>
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<td>Total household income level (reference group: Bottom quintile)</td>
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<tr>
<td>Second lowest quintile</td>
<td>1.087</td>
<td>1.558</td>
</tr>
<tr>
<td></td>
<td>(0.40)</td>
<td>(1.32)</td>
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<tr>
<td>Middle quintile</td>
<td>0.610</td>
<td>0.930</td>
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<td></td>
<td>(-1.94)</td>
<td>(-0.23)</td>
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<tr>
<td>Second highest quintile</td>
<td>1.383</td>
<td>0.402***</td>
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<td></td>
<td>(3.13)</td>
<td>(-1.55)</td>
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<tr>
<td>Top quintile</td>
<td>0.537</td>
<td>0.263**</td>
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<td></td>
<td>(-1.17)</td>
<td>(-2.02)</td>
</tr>
<tr>
<td>Missing</td>
<td>1.087</td>
<td>1.558</td>
</tr>
<tr>
<td></td>
<td>(0.40)</td>
<td>(1.32)</td>
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<tr>
<td>Observations</td>
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<td>459</td>
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<tr>
<td>Pseudo R-squared</td>
<td>0.0867</td>
<td>0.0547</td>
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</table>

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1