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Faculty of Social Science

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The Labour Market Behaviour of Older Adults in China: Patterns, Associated Factors and Policy Implications

by

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Thesis for the degree of Doctor of Philosophy in Gerontology

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Abstract

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Against the background of population ageing, the financial sustainability of the public pension system has become a major concern in the Chinese context. While extending the working lives of older adults has been considered as an important solution, there is limited information of the labour market behaviour of older adults in China, as well as the factors that influence their labour market behaviour in later life. In order to achieve better exploitation of human resources of older adults, research on a comprehensive understanding of the labour market behaviour of older adults is required. Making use of longitudinal data and retrospective data, this thesis examines a) the patterns of labour market behaviour of older adults at different time points over the life course and b) the potential impact of individual characteristics, family characteristics and work experiences on the labour market behaviour in later life.

The results show that there is wide heterogeneity in labour market behaviour, which continues over the life course. In addition, there are significant changes in the labour market behaviour over time, which are largely related to the institutional backgrounds. In terms of influencing factors, the results confirm the effect of individual characteristics, family characteristics and long-term factors on labour market behaviour in later life. Specifically, the importance of intergenerational material transfers and time transfers with other family members, and work trajectories is highlighted, which is rarely studied in the Chinese context. These findings can help to inform policy-makers with the reform of the public pension system, as well as the development of a healthy ageing agenda which incorporates other relevant areas of work, such as family care policies.

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Research Thesis: Declaration of Authorship

Print name:	Maodi Xu

Title of thesis:	The Labour Market Behaviour of Older Adults in China: Patterns, Associated Factors and Policy Implications

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

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2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission.

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Definitions and Abbreviations

ADL	Activities of Daily Living
BHPS	British Household Panel Survey
CHARLS	China Health and Retirement Longitudinal Study
CNY	Chinese Yuan
ELSA	English Longitudinal Study of Ageing
HRS	Health and Retirement Study
IADL	Instrumental Activities of Daily Living
OECD	Organisation for Economic Cooperation and Development
OPP	Occupational Pension Programme
OR	Odds Ratio
RSPP	Residents' Social Pension Programme
SES	Socio-economic Status
SHARE	The Survey of Health, Ageing and Retirement in Europe
SOE	State-owned Enterprise
SPA	Statutory Pension Age
TVE	Township and Village Enterprise
UK	the United Kingdom
US	the United States

Chapter 1 Introduction

1.1 Introduction and rationale

This thesis aims to develop a comprehensive understanding of the labour market behaviour of older adults in the People's Republic of China (hereafter: China). Making use of recently available nationally representative survey data and advanced quantitative methods, this thesis examines a) the patterns of the labour market behaviour of older adults and b) the factors influencing the labour market behaviour in later life. Firstly, this thesis investigates the patterns of labour market behaviour of current Chinese older adults at different time points over the life course. It analyses the labour force participation at one point in time, the transition into economically inactive status over a four-year period and finally the work histories over the life course. These analyses show there to be significant heterogeneity in the labour market behaviour over the life course between different social groups. The widest heterogeneity (largest inequalities) exists between urban and rural residents, and between men and women, and it persists across different birth cohorts. Secondly, this thesis then goes on to examine the factors influencing the labour market behaviour in later life. The impact of individual characteristics, family characteristics, work experiences and institutional background on the labour market decisions is analysed. The empirical evidence presented in this thesis informs the design of social policies, with the intention to reduce the inequalities in the labour market in order to improve the efficiency of the public pension system.

The development of this thesis responds to the challenges in China's public pension system against the background of population ageing and the changes in the age structure of the labour force. China has experienced a rapid demographic transformation since the 1980s. It has become an aged country at the very end of the 20th century, when the proportion of the population aged 60 (and 65) and over reached 10% (and 7%). Moreover, the proportions of these two groups in the total population are estimated to double in 26 years and 25 years from 2000, reaching 20% and 14% respectively (United States Census Bureau, 2016).

Such a demographic transformation has a major impact on China's labour market and the public pension system. The population ageing process, *ceteris paribus*, results in an increasing proportion of individuals who are dependent on pension benefits and a declining proportion of the working age population who contribute to the pension system. The imbalance between the revenue and expense in public pension programmes can raise questions about the financial sustainability of the pension system itself. Researchers and commentators have expressed concerns about the financial sustainability of China's public pension system (Peng, 2011; Tian and

Zhao, 2016; Zheng, 2017). While a potential financial risk related to the pension fund has existed for a long time due to the reform of the public pension system (see Section 1.4), the changes in the population structure exacerbate the situation that the country is facing.

Aiming for a financially sustainable pension system, the government is currently working on solutions across several different dimensions. For example, the two-child fertility policy is seen as an important reform in order to adjust the population structure, but the potential impact on the labour market will not take effect for several decades (State Council of China, 2015). In terms of the pension system, the government has considered extending the working lives of urban labourers as one possible solution for achieving a sustainable pension system (State Council Information Office of China, 2017). Worldwide, many countries faced with the ageing process have been seeking opportunities to extend the working lives of individuals, including raising the statutory age of retirement, and there has been a significant upward trend toward the higher labour force participation of older workers (Dixon, 2003; Hasselhorn and Wenke, 2015; Banerjee and David, 2016). However, at the time of the writing of this thesis, no official date for the implementation of such a policy in China has been set (State Council Information Office of China, 2017).

Existing literature has identified the inequalities in the labour market as one of the major impediments for extending the working lives of older adults in China. Empirical evidence has portrayed a segmented labour market where urban older adults are basically secure with generous pension benefits while the majority of rural residents continue to lack access to them (Benjamin *et al.*, 2003; Pang *et al.*, 2004; Zhang *et al.*, 2014; Giles *et al.*, 2015).The household registration (*Hukou*) system[1] is an important policy that perpetuates the inequalities between urban and rural residents.

While previous studies have critically addressed the inequalities in the labour market in China, what is missing is an understanding of the labour market behaviour as a long-term process. Most

[1] *Hukou* is a household registration record that officially identifies a person as the resident of an area; an individual's initial *Hukou* status is in accordance with a person's place of birth (State Council of China, 1958). In General, *Hukou* can be classified as agricultural and non-agricultural *Hukou*; residents with agricultural and non-agricultural *Hukou* are referred to as 'rural residents' and 'urban residents' in this thesis. There is a third *Hukou status,* i.e. the unified *Hukou* of Residence, which is provided to residents born after 2014 with unified *Hukou* of Residence at birth regardless of their living areas; however, it is less relevant to the samples of this study (State Council of China, 2014a). Restrictions on moving outside one's place of residence and changing *Hukou* were very strict before the 1970s; even if relevant regulations have loosened in recent years, the requirements related to obtaining non-agricultural *Hukou* and permanent residence in urban areas are usually difficult to achieve at present (e.g. offers of formal work or acceptance to schools in urban areas) (Li, 2008).

of the existing studies in the Chinese context provide a snapshot of labour market behaviour at one point in time based on cross-sectional data (ibid) and these studies rarely reflect the dynamics of labour market behaviour over a long period. In contrast to the growing body of literature on the understanding of work histories and the changes in the labour market behaviour over time, relevant studies are very limited in the Chinese context.

Equally importantly, there is a scarcity of evidence of the impact of factors that influence labour market behaviour in the Chinese context. On the one hand, the understanding of the effect of family characteristics is limited. While family factors have been shown to be central in shaping labour market behaviour in the Western context, especially amongst women, (see Section 2.4), the impact of family characteristics remains under-researched in the Chinese context. Family factors are closely related to other relevant policies for the public system of social protection in an ageing society, such as the long-term care system. This is especially the case in the Chinese context, where intergenerational family relationships are stronger (Cai, 2003). On the other hand, there is a research gap in terms of the impact of early life experiences. Early life experiences have been recognised as influential on labour force participation in the existing studies based on other countries (see Section 2.3.6). This aspect relates directly to the earlier point about understanding the patterns of work histories, as only the recently available retrospective data can provide evidence on the complete work trajectories of older individuals in China and the accumulated impact of their past experiences.

Given the importance of understanding the inequalities in the labour market for the extended working lives of older adults and the improved viability of the pension system and the research gaps on this issue discussed as above, the research aim of this thesis is to achieve a comprehensive understanding of the labour market behaviour of older adults in China. Specifically, this thesis addresses the five research questions as below:

RQ 1 What are the labour force participation patterns of older adults in China and how do these vary across different social groups?

RQ 2 What are the patterns of labour market exit of older adults in China and how do these vary across different social groups?

RQ 3 What are the work history patterns of older adults in China and how do these vary across different social groups?

RQ 4 What are the correlates of the labour force participation of older adults and how can they explain the heterogeneity in labour force participation between different social groups?

RQ 5 What are the predictors of the labour market exit in later life and how can they explain the heterogeneity in labour market exit between different social groups?

Prior to the investigation of these research questions, the meaning of 'older adults' and 'labour market behaviour' in this thesis should be clarified. There are a wide range of definitions of 'old

age' in existing literature, depending on the nature of the enquiry and the availability of data (Dahl *et al.*, 2000; United Nations, 2001; Bolin *et al.*, 2008). In this thesis, 'older adults' are defined as individuals aged 45 and over. Although this might be viewed as relatively low by international standards, currently ages 50 and 45 are the lowest thresholds for statutory retirement and being in receipt of the occupational pensions for men and women respectively in China (see Section 1.4). The investigation of individuals aged 45 and over is meaningful as the thesis attempts to shed light on the labour market behaviour of individuals who have attained or who are approaching the Statutory Pension Age (SPA). It is also important to note that whenever possible, the thesis differentiates within the older population, looking at five year age groups rather than treating all those aged 45 and over as homogeneous.

Labour market behaviour is a broad concept that is related to labour supply. The term has different meanings in the existing literature, such as the timing and length of jobs, economic activities and work intensity (United States Department of Labor, 2014). The research focus of this thesis is the outcome of working or being economically inactive at different time points over the life course. Specifically, the following aspects of labour market behaviour are analysed in this study: a) labour force participation (i.e. being economically active); b) the transition from economically active into an economically inactive status (i.e. labour market exit) over a period and c) the work trajectories over the life course which present the labour force participation of individuals at each observed time point (see Section 3.5).

The definition of retirement in this thesis should be clarified as well. Retirement has different definitions in the existing literature. Some studies equate retirement with being economically inactive (Radl, 2013; Jacobs *et al.*, 2014). Some studies define retirement as the status of receiving pension benefits from public or private pension programmes (Berkel and Börsch-Supan, 2004; Schils, 2008). Other studies treat retirement as a self-perceived notion. Individuals report themselves as retirees based on their subjective evaluations, and retirement is not necessarily related to inactivity or the receipt of pensions (Humphrey *et al.*, 2003). This thesis follows the second type of definition of retirement. Under this definition, retirement in the Chinese context is only achieved by proceeding to the official retirement procedure and receiving benefits from the Occupational Pension Programme (see Section 1.4). Individuals who are defined as 'retired' can have paid work and receive pension benefits at the same time. Notably, it is not appropriate to equate being economically inactive with retirement since a large proportion of older adults in China have not had access to the Occupational Pension Programme in their lifetime (see Section 1.4). Thus, the term 'economically inactive' is more frequently used in this thesis.

This thesis addresses RQs 1 to 3 in order to provide a comprehensive picture of the patterns of labour market behaviour. The heterogeneity across different social groups and the changes in the labour market behaviour across cohorts are described. Three specific aspects with different lengths of observation period are investigated accordingly using descriptive analysis: a) the prevalence of labour force participation amongst older people at a one specific time point (year 2013); b) the transition to economically inactive status over the four-year period from 2011 to 2015 and c) the complete work trajectories over the life course (from ages 25 to 60).

Once the patterns have been described, this thesis then addresses RQs 4 and 5, using multivariate analysis to better understand the factors that influence the labour market behaviour of older adults. The impact of individual characteristics, interactions with family members, past work experiences and the institutional background are all investigated. RQs 4 and 5 focus on the correlates of the labour force participation of older labourers and the predictors of labour market exit respectively. It would be interesting to investigate whether there are differences in the impact of the same series of variables on the two different labour market outcomes for a better understanding their meaning to the labour market decisions in later life.

These two aspects of enquiry are closely related to each other. On the one hand, by showing the variations in labour market behaviour between different social groups, the descriptive results in relation to RQs 1 to 3 provide evidence on the potential factors influencing the labour market behaviour in later life. On the other hand, the analysis to address RQs 4 and 5 provides further information on the understanding of the heterogeneity within labour market behaviour and indicate the solutions to reducing the inequalities in the labour market.

This thesis contributes to the existing literature in four ways. Firstly, in terms of the patterns of labour market behaviour, this thesis is a pioneering work to investigate the entire work histories of individuals in China, which adds depth to our current knowledge on the labour market behaviour of older adults. This thesis reveals significant social heterogeneity within labour market behaviour, which not only exists in later life but also has already existed much earlier. In addition, the comparison between the work histories of different cohorts reflects the persistence of the heterogeneity in recent decades.

Secondly, the findings in this thesis highlight the importance of family characteristics in explaining the labour market behaviour in later life. Specifically, the impact of intergenerational material transfers and the impact of care provision to family members are analysed in this thesis – both topics are underresearched in the Chinese context. Besides that, the impact of family characteristics explains the gender differences in labour market behaviour under the current work and social welfare policies, where women are disadvantaged due to the higher burden of family

obligations that they undertake. These findings indicate the importance of incorporating family needs into the effort to improve the labour force participation of older adults, which is currently absent in the policy framework.

Thirdly, this thesis shows that work and family trajectories in past lives are important in shaping the labour market behaviour in later life. This is crucial empirical evidence for further research on the accumulated impact of these long-term factors. Relevant research is generally restricted to the US and European countries and remains to be limited in China at present compared to the large body of literature concerning the impact of proximate conditions on labour market behaviour.

Lastly, the results in this thesis confirm the power of life history data compared to the traditional summarised-variables (such as years of employment). In this thesis, the life history data enable the description of the entire sequence of work histories without reducing the work trajectories to separate transitions at different time points and provide additional information on the labour market behaviour of older adults compared to the prospective data. Specially, the typology of work histories generated from the cluster analysis is very helpful in identifying heterogeneity across and within different groups. In this sense, the collection of retrospective data can be a convenient and promising option for countries with limited availability of longitudinal data.

The rest of this chapter provides essential information on the context in relation to the labour market behaviour of older adults in China. The current generation of Chinese older adults have experienced a unique set of economic and social events over their life course, which may have influenced the trajectories of their work histories and which in turn may have impacted upon their labour market behaviour in later life. Section 1.2 introduces the population ageing process in China. Section 1.3 discusses the changes in China's economic system and labour market over the past several decades. Section 1.4 discusses the development of the public pension system. Section 1.5 introduces the familial context in relation to labour market behaviour, including the ideology of gender and the social norms of family values. Lastly, Section 1.6 provides an overview of the structure of this thesis.

1.2 Demographic context of labour market behaviour: China's population ageing process

This section introduces the population ageing process in China. Population ageing in different countries worldwide happens for the same reasons: rising life expectancy and declining fertility rates, both of which result from the development in the economy and health systems, and

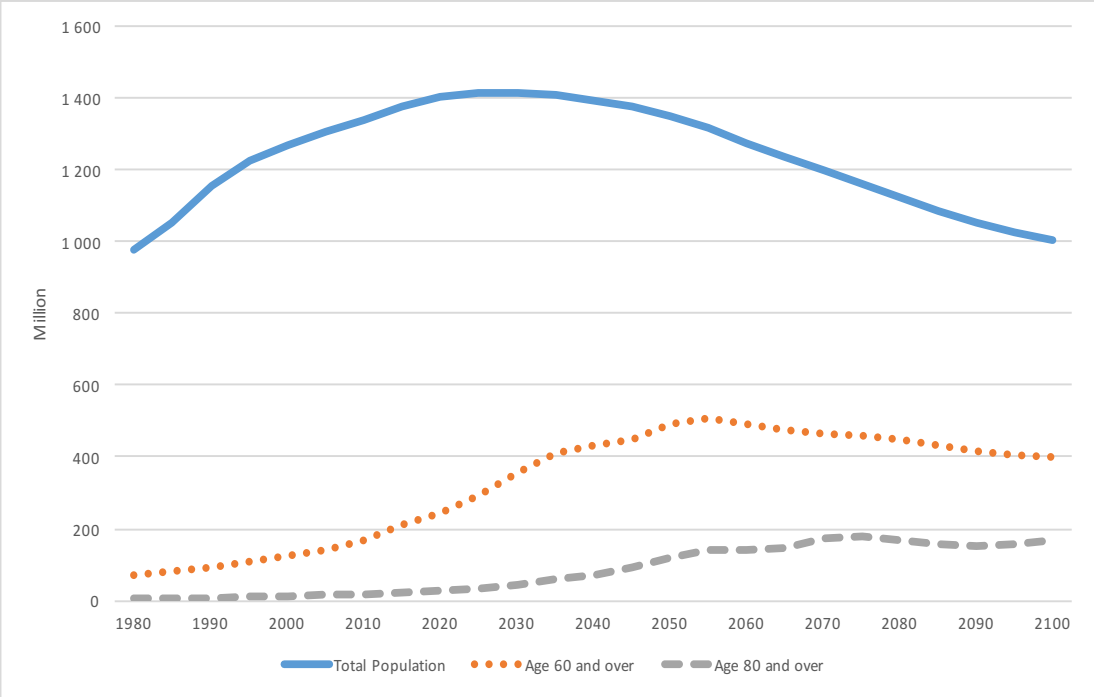
associated changes in social values (United Nations, 2015). The specificity of the ageing process in China is that it has been largely shaped by the 'one-child' policy that started in the 1970s, which explains the abrupt decline in the fertility rate (Chen and Liu, 2009). The implementation of this policy led to a faster ageing process compared to other countries. According to the United Nations (2015), the proportion of the population aged 60 (and 65) and over is estimated to double in 26 years (and 25 years), reaching 20% (and 14%) by around 2025. Compared to most other developed countries, this is a relatively short duration. For instance, it took 144 and 78 years respectively for the proportion of the population aged 60 and over to double in France and the US (United Nations, 2015). The dramatic changes in the population structure in China make the concern regarding the labour market structure and pension system particularly urgent for the Chinese government as it only has a limited time to adapt the current labour market and welfare policies in response to population ageing.

The author uses three indicators to measure the pace of population ageing in China since the 1980s: the absolute size of the older population, the relative size of the older population and the dependency ratio. The results using these three indicators reflect a consistent trend that the population ageing process will continue in the first half of this century and continue to develop rapidly over the next 30 to 40 years. These findings further reinforce the timeliness of this study.

Firstly, the absolute size of the older population is large and will continue to grow. According to Figure 1.1, the size of people aged 60 and over (80 and over) was around 200 million (and 20 million) in 2015. The number of people aged 60 and over in China has been increasing steadily since 1980 and will continue to grow. It is estimated to reach the peak at 446 million older adults in approximately 2055. The increase in the number of adults aged 80 and over follows a similar pattern; the number of people aged 80 and over is estimated to reach a peak of 125 million in 2075. By the middle of this century, China will have the world's largest population group in this regard.

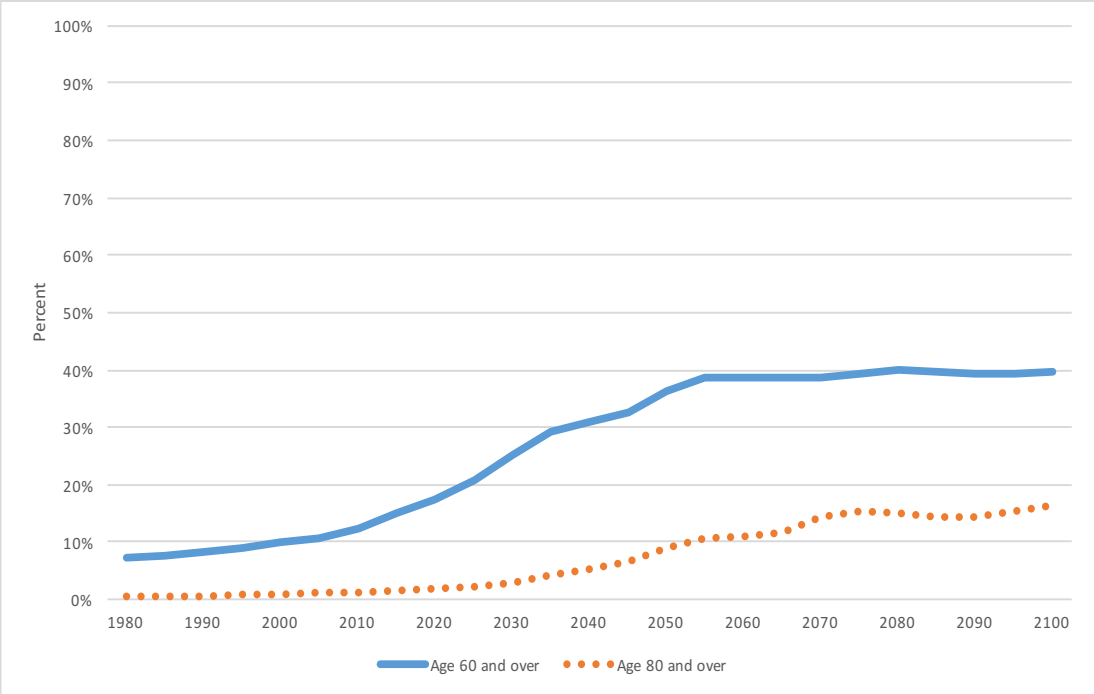
Secondly, the relative size of the older population is estimated to increase at a fast speed until 2050. According to Figure 1.2, adults aged 60 years and over in China will account for more than 35% of the total population in 2050, and this proportion will be stable between 2050 and 2100. The rate of increase in the proportion of individuals aged 80 years and over is similar and will reach a peak of 11% at around 2075.

Figure 1.1 The number of the population aged 60 plus and 80 plus in China, 1980-2100



Source: Author's own analysis using data from United Nations (2015); projections from 2015 onwards.

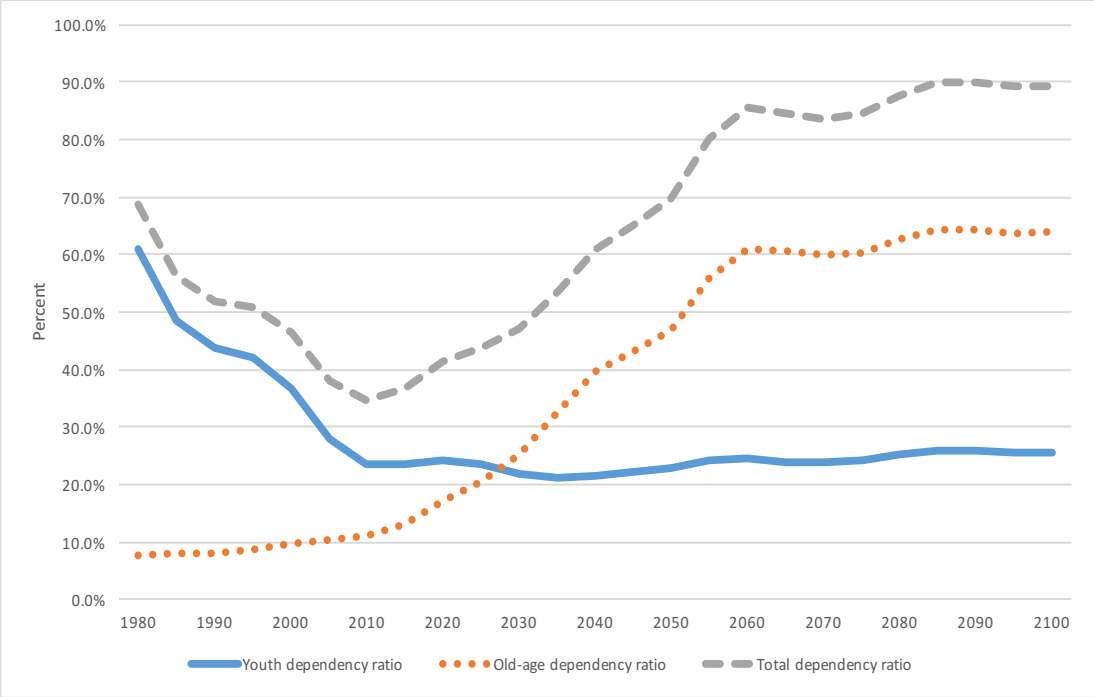
Figure 1.2 The percentage of the population aged 60 plus and 80 plus in China, 1980-2100



Source: Author's own analysis using data from United Nations (2015); projections from 2015 onwards.

Thirdly, the changes in the old-age dependency ratio and total dependency ratio in China indicate the pressure of the population ageing process on the public pension system and on the labour force. Following the definition from the United Nations (2001), the old-age dependency ratio is defined as the number of persons aged 65 and over out of the number of persons aged 15 to 64 years old. Similarly, the youth dependency ratio is defined as the number of persons aged 0 to 14 years out of the number of persons aged 15 to 64 years old (ibid). The total dependency ratio is the sum of the youth dependency ratio and the old-age dependency ratio (ibid). Figure 1.3 shows that the old-age dependency ratio has increased rapidly since 2010. The youth dependency ratio was high in 1980, but it has declined steadily until recently, reflecting the decline in the fertility rate as a result of the 'one-child' policy. The combination of old age and youth dependency ratios results in a U-shaped total dependency ratio curve. The total dependency ratio has experienced a decrease over since 1980 and came to the lowest point in around 2010. The proportion of the non-working older people compared to the working-age group has begun to increase since the 2010s, which implies there to be increasing pressure on the adequacy of labourers and the viability of the public pension system.

Figure 1.3 Dependency ratios in China, 1980-2100



Source: Author's own analysis using data from United Nations (2015); projections from 2015 onwards.

1.3 Economic context of the labour market behaviour: China's labour market since the 1950s

China's labour market has undergone a series of remarkable transformations that have dramatically affected the working lives of individuals. This section introduces the development of China's labour market since the 1950s, which presents a richer understanding of the labour force participation of older adults. This period can be divided into the Mao era (or the pre-reform era), and the post-Mao era (or reform and open-up era) since 1978; the two eras feature distinctive economic and institutional backgrounds.

Stark differences in the economic structure and the labour market between urban and rural areas have a long history, predating the 1950s which is the starting point of the new socialism regime and the planned economy system. For most of the twentieth century, the agricultural sector dominated China's economy and provided the main source of employment. As shown in Table 1.1, 84 percent of the workforce was engaged in agriculture and 88 percent of the workforce was residing in rural areas in 1952. These proportions had declined slightly by 1978, but the agricultural sector still accounted for over two-thirds (70.5%) of all employment and three-quarters (76.3%) of workers were living in rural areas.

Under the centrally planned economy, the government controlled the allocation of labour and levels (and distribution) of production. The proceeds from agriculture and industry were centralised to support the country's programme of industrialisation in selected urban areas, with labourers receiving subsistence earnings (Cai *et al.*, 2008). The mobility of labour was very limited. In urban areas, the quotas and wages of work positions were set centrally; in rural areas, agricultural activities of rural households were organised by production teams and there was little or no individual production (ibid). The implementation of the household registration *(Hukou)* system controlled the flow of population between urban and rural areas.

During the pre-reform era, the authority control reached a peak around the late 1960s, when the state-owned and collective organisations reached a dominant position in the economy (ibid). In addition, teenagers and young adults living in cities were sent down to the countryside and forced to engage in agricultural work after finishing junior or senior high school during the Send-down Movement (Li *et al.*, 2010). In the meantime, primary school, junior and senior and universities all have experienced shutdowns.

Table 1.1 Total employment in China, by sector and living area, 1952-2015

	1952	1978	1990	2000	2010	2015
Total employment (million)	207.3	401.5	647.5	720.9	761.1	774.5
By sector (million)						
-Agricultural	173.2	283.2	389.1	360.4	279.3	219.2
-Industrial	15.3	69.5	138.6	162.2	218.4	226.9
-Tertiary	18.8	48.9	119.8	198.2	263.3	328.4
By residence (million)						
-Urban workers	24.9	95.1	170.4	231.5	346.9	404.1
##State units	NA	74.5	103.5	81.0	65.2	62.1
##Collectives	NA	20.5	35.5	15.0	6.0	4.8
##Joint	NA	0.0	1.0	2.0	1.9	1.1
##Private business	NA	0.0	0.6	24.1	97.1	193.7
##Foreign funded business	NA	0.0	0.7	6	18.23	28
##Self-employment	NA	0.2	6.1	21.4	44.7	78
-Rural workers	182.4	306.4	477.1	489.3	414.2	370.4
##TVEs	0.0	28.0	92.7	128.2	158.9	NA
##Private business	0.0	0.0	1.1	11.4	33.5	52.2
##Self-employment	0.0	0.0	14.9	29.3	25.4	38.8
By sector (percent)						
-Agricultural	83.6%	70.5%	60.1%	50.0%	36.7%	28.3%
-Industrial	7.4%	17.3%	21.4%	22.5%	28.7%	29.3%
-Tertiary	9.1%	12.2%	18.5%	27.5%	34.6%	42.4%
By residence (percent)						
-Urban workers	12.0%	23.7%	26.3%	32.1%	45.6%	52.2%
##State units	NA	18.6%	16.0%	11.2%	8.6%	8.0%
##Collectives	NA	5.1%	5.5%	2.1%	0.8%	0.6%
##Joint	NA	0.0%	0.2%	0.3%	0.2%	0.1%
##Private business	NA	0.0%	0.1%	3.3%	12.8%	25.0%
##Foreign funded business	NA	0.0%	0.1%	0.8%	2.4%	3.6%
##Self-employment	NA	0.0%	0.9%	3.0%	5.9%	10.1%
-Rural workers	88.0%	76.3%	73.7%	67.9%	54.4%	47.8%
##TVEs	NA	7.0%	14.3%	17.8%	20.9%	NA
##Private business	NA	0.0%	0.2%	1.6%	4.4%	6.7%
##Self-employment	NA	0.0%	2.3%	4.1%	3.3%	5.0%

Note: 1) State units include SOEs, governments and public institutions. 2) Joint business are economic organizations by the collaboration between the state and collective sectors, or between the state and private sectors. 3) Foreign-funded business also includes Hong Kong SAR, Macao SAR, and Taiwan Province of China funded business. Source: Yearbook (various years).

By the late 1970s, the government had begun to recognise that the system of the planned economy was failing to function efficiently in terms of the allocation of products and labourers (Cai *et al.*, 2008). Against this background, a programme of economic reforms was launched, which has revolutionised the economic structure of China and the associated labour market.

Reforms were introduced first in rural areas. With the introduction of a new system of household responsibility and the dissolution of collectivised agriculture in 1978, rural residents were given decision-making powers over their own agricultural activities; the choice over what to grow, when and how greatly improved their productivity and incentives (Tao and Brooks, 2003). The 1980s and 1990s witnessed the growth of township and village enterprises (TVEs), which contributed to the development of non-agricultural employment in rural areas. As shown in Table 1.1, between 1990-2010, the overall share of agricultural workers significantly declined from 60 percent to 37 percent of the workforce, whilst employment in TVEs in rural areas increased dramatically, with the sector accounting for 159 million rural workers in 2010, constituting over one fifth (20.9%) of all workers.

A main goal of the economic reforms in urban areas was to improve economic efficiency by encouraging competition between different economic bodies. With the gradual loosening of regulations since the mid-1990s, there has been a sharp increase in new economic forms, including a dramatic rise in private and foreign-funded enterprises. The proportion of workers employed within private businesses reached 31.7% in 2015 (25% in urban areas and 6.7% in rural), with a further 15% of workers being self-employed (10% in urban and 5% in rural areas) (Table 1.1). In contrast to the success of many of the new private enterprises, during the 1990s many state-owned enterprises (SOEs) and urban collective enterprises recorded financial losses, with the heavy financial burden of regulated wages and welfare provision often presented as an underlying reason. In response, the government embarked upon a largescale restructure of the SOEs and urban collective enterprises and laid off a large number of workers in these organisations (Tao and Brooks, 2003). The proportion of all workers employed in state-owned and collective enterprises has declined from 21.5% in 1990 to just 8.6% in 2015 (Table 1.1). The process of re-structuring resulted in high unemployment rates amongst former SOE workers; many of them were unemployed for years or relocated to jobs with relatively low wages after the failure to find satisfactory jobs (ibid).

The growth of private enterprises generated a continuous need for labour and triggered a largescale migration from the agricultural sector to the non-agricultural sector, and from rural to urban areas. More and more previous agricultural workers got involved in the increasingly industrialised economy system. The gradual loosening of regulations regarding population

movement further facilitated the migration. Since the 1990s, the movement of rural workers into the non-agricultural sectors in urban areas has outpaced the move into TVEs (Li, 2008). As a result, the proportion of the workforce living in rural areas has declined continuously, falling from around three-quarter before the reform to under half (47.8%) in 2015 (Table 1.1). There were reported to be 286 million migrant workers in 2015, contributing to a large proportion of urban labourers (National Bureau of Statistics, 2017). The twin tracks of migration and urbanisation have resulted in a radical redistribution of the Chinese population in the space of just 30 years.

1.4 Institutional context of labour market behaviour: China's public pension system and the associated challenges

This section introduces the development of China's public pension system and the two major issues of the current system (segmentation and financial unsustainability). This information provides essential background to the understanding of the labour market behaviour of workers, which is shaped by the institutional background remarkably. The full list of key documents is presented in Table A.1 in Appendices A. The development of the public pension system (and the wider social protection system) is consistent with the changes in the economic system. Most of the major changes took place after the economic reforms began. Until the 1980s, the old-age pension system was highly decentralised, with SOEs taking sole responsibility for the pension benefits of their own workers (Dunaway and Arora, 2007). The lack of portability of pension benefits between workplaces and between state and non-state sectors restricted labour mobility and perpetuated the notion of a job for life within the same organisation. Moreover, there was no comparable system in rural areas at all after the termination of the collective agricultural system, which used to provide 'in-kind' benefits to its members. As the economic reforms began to mature, it became clear that a reform of the pension system was also required.

The nationwide reform of the public pension system was implemented in 1997 and the system has experienced continuous modifications in response to the changing economic context (State Council of China, 1997). The Occupational Pension Programme (OPP) is the major element of the public pension system[2]. The initial OPP only covered urban enterprise workers from the formal sector. With the emergence of new forms of economic activities during the economic reform, regulations were adjusted to facilitate the participation of all urban labourers, especially those

[2] The design of the current public pension system follows the multi-pillar concept adopted from the United Nations (World Bank, 2008). Other social security programmes include the Subsistence Allowance Programme ('zero-pillar', a means-tested programme which provides minimum financial support to all the residents in poverty prevention) and Enterprise Annuity (voluntary).

with less attachment to the formal economy[3]. By the end of 2016, there were 379.3 million registered participants of the OPP (Ministry of Human Resources and Social Security, 2016).

Table 1.2 presents the details of the design of the OPP. The SPA varies according to the different retirement schemes (State Council of China, 1978, 1997). The standard retirement procedure is for employees reaching the age of 60 (males)/50 (ordinary female staff)/55 ('female cadres', including females from certain institutions and work positions) with a minimum of 15 continuous working years. Early retirement and disability retirement schemes require fewer working years to claim pension benefits but they provide lower benefit levels at the same time. The contribution of the OPP is comprised of two components: employers pay an amount equivalent to 20% of the previous year's average wage of the local area (social pooling accounts) and the employees pay 8% of their personal wages (individual accounts). The pension benefits are then derived from the two accounts dependent on the individuals' wages and their years of contribution, aiming for a 60% replacement rate when the reform began (State Council of China, 1997).

Specifically, employees with *Bianzhi* are privileged in terms of pension entitlements. The *Bianzhi* (*Bianzhi*) system refers to the quota of employees in each economic organisation and in each occupational rank. This originates from the planned economy system (Brødsgaard, 2002). Employees with *Bianzhi* refers to formal employees in the government and public institutions and employees above certain ranks in SOEs[4]. There were about 40 million employees with *Bianzhi* in China in 2015 (Ministry of Human Resources and Social Security, 2015). Employees with *Bianzhi* do not make any personal contribution towards their pensions and their pension benefits after retirement are provided by the government. In the meantime, they receive a much higher pension income after retirement than other employees[5]. The average replacement rate of their pension benefits is estimated to be about 90%, which is much higher than the average replacement rate of the OPP (State Council of China, 1978). The attempt to equalise the pension

[3] In contrast to the formal sector (or formal economy), the informal sector is the part of an economy that is neither taxed nor monitored by any form of government. The informal economy contributes to the country's economy but it is difficult to calculate it using the country's Gross Domestic Product (Hussmanns, 2004). Typical forms of informal economy include street vending and household services.

[4] Public institutions are organisations which are established and supported by fiscal subsidies that are responsible for public welfare, including education, science and technique development, in addition to cultural and public health.

[5] Specifically, the calculation methods of the pension benefits within this group can be different. The pension benefits for civil servants is based on their salary and working years. Those with no less than 35 working years can receive 90% of last year's salary before retirement, plus an allowance, as their pension. For employees with Establishment from SOEs, their benefits are similarly calculated to the OPP. For public institutions, whether the calculation method is the same as that of the civil servants or the OPP depends on the classification of the organisation.

benefits of employees with *Bianzhi* and other employees only started in 2017 and substantial changes are still limited at present (State Council of China, 2015).

As an important institutional background, the OPP sets limitations on the behaviour of employees and the employers at the same time, making retirement a completely free choice of the individuals in any countries impossible (Siegrist and Wahrendorf, 2010). Retirement in China is sometimes reported as 'mandated' or 'compulsory'. For instance, the retirement age ceiling can be strictly enforced amongst civil servants. Individuals who reach the SPA may be forced to process their retirement and end employment (Giles *et al.*, 2015). These propositions further highlight the importance of understanding the role of the public pension system in shaping labour force participation in China.

Table 1.2 Design of the Occupational Pension Programme (2019)

Target Population	Urban employees
Payment	• Payment to the social pooling account and to the individual account at the same time. • Social Pooling Account: Pay-As-You-Go (PAYG) account. Employers pay an amount that equals 20% of last year's average wage in local areas*. • Individual Account: Nominal Defined-Contribution Account (since 2018). Employees pay 8% of the personal wage.
Eligibility for benefits	• The Statutory Pension Age and the minimum contribution period vary by scheme. • Standard retirement: people who are age 60 (male workers), 50 (ordinary female staff) or 55 ('female cadres', which refers to female from certain institutions and positions, usually with *Bianzhi*), with at least 15 continuous working years, can proceed to retirement. • Early retirement: enterprise workers from high-risk industries (such as exposure to high temperatures or harmful elements) can process to early retirement upon reaching age 55 (male) or age 45 (female), with a minimum of 10 continuous working years. • Disability retirement: People who lose the ability to work by the official diagnosis of disability can process to disability retirement reaching age 50 (male) or age 45 (female) with a minimum of 10 continuous working years. Retiring before this age causes a loss in pension benefits (2% per year).
Benefit levels	• Benefit from the social pooling account and from the individual account. • Benefit from the social pooling account = (last year's average wage in local areas + weighted average monthly contribution of participants) *1/2*Years of contribution*1%. • Benefit from the individual account = accumulation from the individual account divided by the number of 'Calculated Payment Months'. The full list of the 'Calculated Payment Months' has been presented in Table A.2. The Calculated Payment Month' at the SPA is 139 (60yrs, men) and 175 (55yrs, women) respectively.

Note: 1) Self-employed workers pay 12% of their salary to the social pooling accounts and the government pay another amount equivalent to 8% of their salaries to the social pooling account. 2) See Table A.2 for detailed information on the calculation of 'Calculated Payment Months'.
Source: (State Council of China, 1997, 2005, 2014b)

While the OPP secures relative generous pension benefits for most urban residents, especially employees with *Bianzhi*, it is difficult for employees who have less access to work positions in the formal sector to participate in this programme, including agricultural workers and migrant workers from rural areas, and urban flexible workers[6]. Against this background, the Residents' Social Pension Programme (RSPP) has been implemented. This programme was launched in 2014 by combining the previous New Rural Social Pension Programme and the Urban Residents' Social Pension Programme (Instructions on the Residents' Social Pension Programme, 2014). This voluntary programme has achieved a high level of coverage, especially in rural areas; it is estimated to have covered 508.5 million participants by the end of 2016 (Ministry of Human Resources and Social Security, 2016).

The benefits of the RSPP are designed to come from both the social pooling account and the individual account. The current basic tariff is 100 Chinese Yuan (CNY)[7] per year (contribution to the PAYG social pooling account, which is largely financed by the government at present). Participators can choose higher tariffs up to 2000CNY per year to fund their individual accounts (State Council of China, 2014b). The benefits are available when the residents reach age 60 with at least 15 years' contribution[8] (ibid). The lower boundary of the benefit was set at 55 CNY per month when initially introduced, and this was improved to 88 CNY per month in 2018 (Ministry of Human Resources and Social Security, 2018).

The design of the OPP and the RSPP reflects the imbalances in pension entitlements and the benefit levels between urban and rural residents, between workers from the formal sectors and those who are not, and between employees with *Bianzhi* and ordinary employees. Apart from the segmentation of the system, the financial unsustainability of the public pension system is another potential challenge that the system is facing, which results from the rapidly ageing population structure as well as the 'legacy cost of reform[9]'. Although the government announcements on this issue are usually positive (State Council Information Office of China, 2018), the changes in the financial operations of the system appear to imply there to be a gap between the revenue and

[6] Flexible workers refer to employees without long-term written contracts and who may work with intervals (The World Bank, 2017). Following this definition, migrant workers with agricultural *Hukou* and urban flexible workers in the informal sector (such as providing street vending and household services) are flexible workers.

[7] The exchange rate between US dollars and CNY was about 1USD: 6.2CNY on average in 2015.

[8] When the programme was implemented in rural areas, residents who had already passed the age of 60 were immediately entitled to the basic pension benefits without paying any premiums. However, receiving benefits was conditional upon the enrolment of eligible children in most provinces.

[9] When new policies were introduced to the public every time, those who were already retired and nearly-retired were able to claim their pensions immediately without any accumulation having been in their individual accounts in the past. The shortage of funding to cover the pensions of this group is defined as 'legacy costs'.

expense. For instance, the individual account was initially designed as a fully-funded account but ended up as a Nominal Defined-Contribution account in 2017 (State Council of China, 2017). The administration organisations have used the money from the contributors' individual accounts to resource the PAYG part since there was not enough prior accumulation of contributions to cover the payments when the system commenced. As a result, there are 'empty' individual accounts as a part of the legacy cost. The authority's several attempts to back-fill the individual accounts have not succeeded as the high return rate of the individual accounts could not be guaranteed and inflation has made the real value of the individual accounts fall against a background of high-speed economic development.

Developing a more equalised pension system has become an important prerequisite for extending the working lives of older people and improving the viability of the pension system. Under the current population structure, the government has been working on new regulations in order to increase the SPA to 65 in recent years to ease the financial pressure (State Council Information Office of China, 2017). The plan received heated discussion and strong opposition from the public; the most important reason for this is the different benefits involved in the public pension programme. Before equalisation within the system, attempts to increase the SPA will be very difficult as the public believes that the new policies are regarded as to widen the gaps between different social groups to a greater extent by the public.

1.5 Familial context in relation to the labour market behaviour in China

This section introduces the gender ideology regarding the division of work and family obligations, and the broader social contexts about family relationships and social protection in China. This information provides the essential background to understand the gender differences in labour market behaviour, which is one of the main focuses of this thesis. Equally importantly, it helps to explain the extent to which the interactions with family members shapes the labour market behaviour of older adults.

The socialist state has maintained a high degree of control over gender construction since the Mao era. Women's involvement in the labour market was encouraged at the start of the PRC, such as the perception of 'Women hold up half the sky', which led to the norm of dual-earner families in China (Fan, 2003; Leung, 2003). Compared to women's status in the traditional agricultural society, the value of women's engagement in the labour market was highly recognised. The availability of childcare nationwide enables women to do full-time work. Similar to the childcare system in the Soviet Union, all work organisations (the government, public institutions and enterprises) provided free kindergartens. The dual-earner family model appeared

to persist in the post-Mao era, although it is argued that the economic reform era has resulted in increasing inequality for women in recent years (Pimentel, 2006). According to Oshio *et al.* (2013), women in China have a higher level of involvement in the labour market and the public has a more positive attitude towards working as an important part of women's life than other East Asian countries.

Interestingly, in terms of family chores and care provision, the existing literature has reported that women still take on more responsibilities concerning the household chores and childcare (Zuo and Bian, 2001). This evidence raises concerns about the conflict between work and family obligations that women may face, especially after the collapse of the old childcare system at the start of the economic reforms. In this case, family relationships become a key factor in understanding the labour market behaviour of individuals in China.

The reciprocity between family members and the union of families has been a tradition for a long time (Shi, 1993; Zhan and Montgomery, 2003). On the one hand, the union of the family is largely shaped by filial piety (Xiao), which is a primary virtue cultivated by Confucianism teachings and work as the cornerstone of Chinese culture for thousands of years (ibid). Being filial means that any children must be deferential and obedient to their parents. Sons bear the ultimate responsibility of taking care of their ageing parents. On the other hand, members within the family network are also important 'blood bonds' that support each other (ibid). The design of the social protection system in modern China is in consistent with these values, especially in rural areas, where welfare benefits are only granted to those who cannot rely on family support for a long time and old-age provision (Stepan and Quan, 2016).

The familial context in China indicates that the interactions between family members can be intensive. Thus, the material and time transfers between family members can have an impact on labour market behaviour, and can have different meanings for labourers from different age groups. In the case of older adults, the author is interested in two aspects. The first aspect is whether the (potentially) gendered family obligations shape the labour market behaviour of old men and women in different ways. The second aspect is the meaning of the material and time transfers to older adults themselves and to other family members. For instance, the meaning of the increasing popularity of skip-generation care in China not only matters to the work intention of older adults, but also to the mothers in their 20s and 30s in China. One unintended consequence of raising the SPA to foster longer working lives might be reducing the level of female labour force participation amongst these women. Evidence in this thesis can provide important policy implications for the labour market in the Chinese context.

1.6 Structure of the thesis

The central concern of this thesis is the labour market behaviour of older adults in China. Chapter 1 introduces the rationale of this thesis and sets out the research questions. It then outlines the Chinese context that is relevant to the labour market behaviour of older adults and the changes taken place over the past decades. This includes the demographic background, the economic background, the institutional background (public pension system) and the familial values that may affect the labour market behaviour.

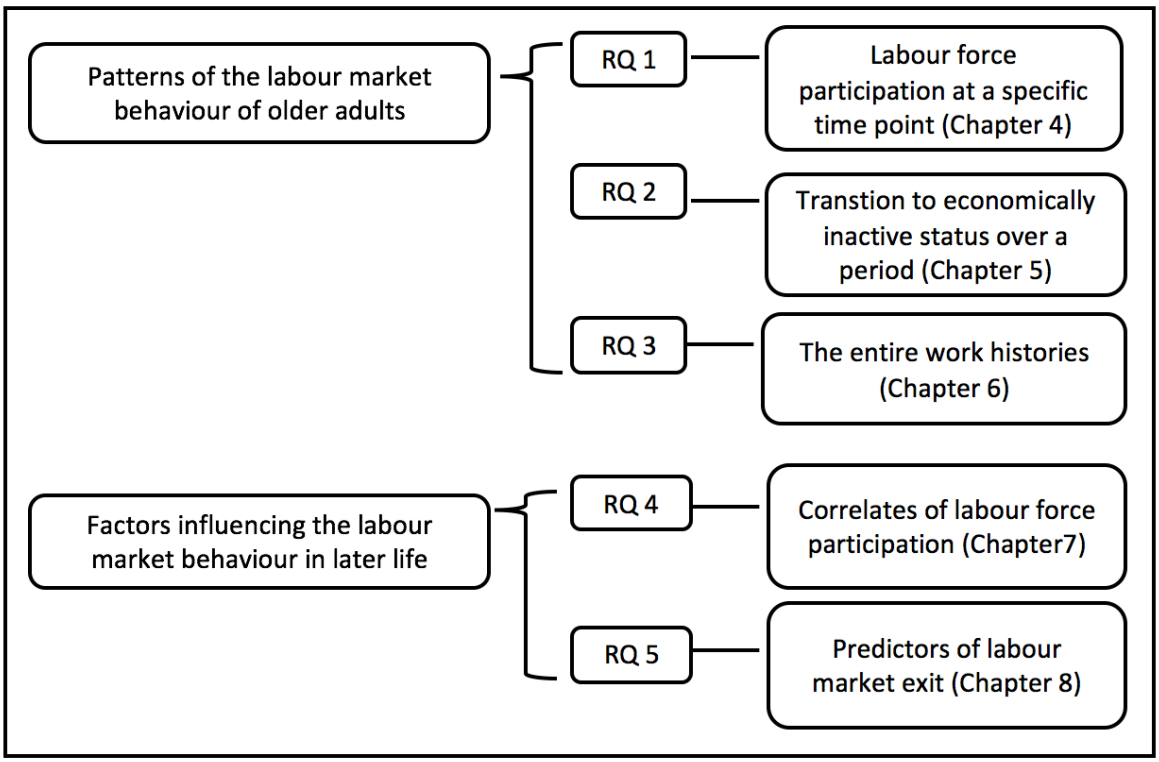
Chapter 2 provides a review of the literature regarding the theoretical and empirical evidence of the patterns and associated factors of the labour market behaviour of older adults which underpins the development of the conceptual framework of this study. By comparing the domestic and international literature, the research gaps in the Chinese context have been identified, which are further addressed in later empirical chapters.

Chapter 3 presents the methodology of this study. The study design, the datasets, the study populations and the analytical strategy used to address the research questions is discussed. The chapter also discusses the variables and data analysis strategy used in the descriptive, bivariate and multivariate analysis in this study.

Chapters 4 to 8 discuss the empirical results of this study. Figure 1.4 shows the arrangement of the empirical chapters in this thesis and their relevance to the research questions. Chapters 4 to 6 aim to present the descriptive results on the patterns of labour market behaviour of older adults over the life course. These three chapters address RQs 1 to 3 in order and concentrate on the labour market behaviour at different time points: Chapter 4 provides an overall picture of the older adults' labour force participation in 2013; Chapter 5 analyses the labour market exit of older adults between 2011 and 2015 using longitudinal data; Chapter 6 examines the entire work histories of the current Chinese older adults. Chapters 7 and 8 investigate the factors that influence the labour market behaviour in later life using multivariate analysis. The impact of individual characteristics, interactions with family members, institutional backgrounds and work histories in the past are analysed.

Chapter 9 concludes this thesis by summarising the main findings in relation to the research questions and discusses the policy implications of the empirical results on the future policy design and the reform of the public pension system in China. The chapter also outlines the limitations of the study as well as the recommendations for future research.

Figure 1.4 Structure of empirical chapters



Source: Author's own analysis.

Chapter 2 Literature Review

2.1 Overview

This chapter provides an overview of the existing studies on the topic of labour market behaviour. A variety of online databases such as AgeInfo, EBSCO, JSTOR and Web of Knowledge have been searched using key terms to identify the relevant literature. Since this thesis focuses on the labour market behaviour of older adults within the Chinese context, the China National Knowledge Infrastructure (CNKI) has also been included as a source of information as it is the largest continuously updated journal database that has been compiled since the 1990s in the Chinese language. Studies addressed in this chapter include journal articles, conference papers, book chapters and reports. These studies are mainly from the field of gerontology, as well as other disciplines in social science such as demography, economics and sociology.

As discussed in Section 1.1, in order to achieve a comprehensive understanding of the labour market behaviour of older adults in China, this thesis focuses on the investigation of a) the patterns of the labour market behaviour of older adults and b) the factors influencing the labour market behaviour in later life. This chapter reviews the current empirical results of these two aspects in Sections 2.2 and 2.3 respectively. Next, the key theories frequently employed by these empirical studies are discussed in Section 2.4. Based on both the theoretical and empirical evidence, a conceptual framework that underpins this thesis is developed and discussed in Section 2.5, which pays particular attention to the research gaps in the Chinese context that are revealed by reviewing the domestic literature and international literature in wider contexts in Sections 2.2 through to 2.4. Lastly, the main findings of this chapter are summarised in Section 2.6.

2.2 Understanding the labour market behaviour of older adults over the life course

Against a background of population ageing, there has been a decline in the labour force participation of prime-aged workers and a gradual rise in the average age of workers in the labour market in many countries (OECD, 2018). Such trends underline the importance of investigating the older labour force. The labour market behaviour of older adults, especially those passing the peak of their careers and approaching retirement, has received increasing attention in recent studies (Dixon, 2003; Humphrey *et al.*, 2003; Banerjee and David, 2016).

Much of these studies have noticed the heterogeneity in labour market behaviour between different social groups at both the micro- and macro- levels and some of them have further addressed the the causal mechanism that lead to the heterogeneity in labour market behaviour (e.g. Gustman and Steinmeier, 2000; Heyma, 2004). For example, gender differences are one of the most frequently discussed aspects concerning personal characteristics (e.g. Widmer and Ritschard, 2009; Finch, 2014; see Section 2.3.1.2).

A wide range of literature on the patterns of labour market behaviour of older adults focuses on the changes in labour market behaviour of older adults over time (Widmer and Ritschard, 2009; Worts *et al.*, 2013; Hasselhorn and Wenke, 2015; McMunn *et al.*, 2015; Banerjee and David, 2016). These studies make use of census data or largescale sampling data to reflect the changes in the older population. All of the countries investigated by these studies (including European countries, the US and Canada) are shown to have experienced a significant trend toward higher labour force participation of older workers, although stark inter-country differences in labour force participation remain. The adjustment of the social welfare system has been shown to be an important macro background for the upward trend in labour force participation. For example, the work of Banerjee and David (2016), using data from the Current Population Survey, has shown that the level of labour force participation of older adults in the US has increased in recent birth cohorts, which is due to the decline in pension benefits and the increased incentives to delay claiming.

Specifically, a noticeable trend in terms of the labour market behaviour over the life course is the increasing diversity and complexity of retirement experiences across cohorts (Brückner and Mayer, 2005). The empirical evidence reflects a series of new characteristics of retirement, including the existence of multiple jobs transitions featuring the re-entry and re-exit of the labour market in later life (Tang and Burr, 2015) and bridge jobs (part-time or short-duration work) before retirement (Kim and DeVaney, 2005; Giandrea *et al*., 2009). As commented on by Mutchler *et al.* (1997), the retirement experience, as an important transition in the life course, has become more 'blurred' rather than 'crisp'.

Accompanying with the increasing research attention on older groups, emerging literature has paid attention to the labour market behaviour of older adults over an extended period of time. On the one hand, studies focussing on the *transitions* of labour market behaviour have made great contributions to the understanding of labour market behaviour (Pavalko and Artis, 1997; Dahl, Nilsen and Vaage, 2000; Kim and DeVaney, 2005; Debrand and Sirven, 2009; King and Pickard, 2013). Compared to early studies which mainly took a static perspective and focused on a snapshot of labour force participation at one point in time, studies on the transitions of labour

market behaviour reflect the changes in labour market behaviour over time and provide more convincing evidence on the causation of the heterogeneity in labour market behaviour. These studies are facilitated by the increased availability of longitudinal data, with observations on the same individuals at more than one point in time collected prospectively.

On the other hand, recent studies on the employment trajectories over the life course have brought new life to the understanding of labour market behaviour, where the work trajectories are analysed in their entirety (Pollock, 2007; Wahrendorf, 2015; Madero-Cabib and Fasang, 2016; Birkett *et al.*, 2017). These studies make use of retrospective life history data which are collected at one point in time but covering an extended time period – such as the SHARELIFE data from the Survey of Health, Ageing and Retirement in Europe (Börsch-Supan *et al.*, 2013).

In comparison, our current knowledge on the labour market behaviour of older adults in China is very narrow. On the one hand, research attention on the labour market behaviour over a longer period is limited. Many studies have shown that a heterogeneous and segmented labour market between urban and rural areas, where urban residents are basically secured with generous pension benefits at relatively low SPAs while the majority of rural residents continue to lack the access to pensions and have much longer working lives (Benjamin *et al.*, 2003; Pang *et al.*, 2004; Zhang *et al.*, 2014; Giles *et al.*, 2015). However, these results are based on snapshots of labour market behaviour at one point in time using cross-sectional data and rarely reflect the labour market behaviour that individuals have experienced over a long period. Particularly, the attention given to the work trajectories of older adults is very limited. In part, this is due to the limitations of the data but it also reflects a general lack of attention to them.

Second, the knowledge available on the changes in labour market behaviour over time is scant. The current generation of Chinese older adults have experienced a unique set of economic and social events over their life course, which are likely to have influenced their work trajectories, and which in turn may have impacted upon their labour market behaviour in later life. However, compared to the increasing body of literature in wider contexts, there is little evidence on the recent trend of labour market behaviour of older adults in China, in terms of the changes in the overall labour force participation as well as the potential increasing turbulence across cohorts. One exception is the work of Kwon & Schafer (2012), which has analysed the cohort differences in work attitudes in China. This study shows that the labour force participation tends to be higher amongst the revolutionary socialism generation (born between 1950 and 1960) but lower for the later generations (born after 1980). The downward trend in work centrality in China can be largely explained by the economic growth since the 1990s. Although this study is not directly related to labour market behaviour itself, it indicates that there can be significant changes in the labour

market behaviour due to the dramatic changes in the background context and there can be large research potential in understanding the work histories of current older adults in China.

2.3 Factors influencing the labour market behaviour in later life: Empirical evidence

This section introduces the empirical findings on the factors that have an impact on the labour market behaviour in later life, drawing on both international and domestic literature. The author has organised the relevant findings into six themes. Section 2.3.1 demonstrates the association between labour market behaviour and ascribed status (age and gender). Section 2.3.2 demonstrates the impact of health status on labour market behaviour in later life. Section 2.3.3 discusses the importance of available financial resources in shaping the labour market behaviour in later life. Specifically, the impact of pension benefits, as the most important income source in later life, is discussed separately in Section 2.3.4. Section 2.3.5 investigates the impact of family characteristics, including marital status, intergenerational material transfers and the care provision to family members. Lastly, Section 2.3.6 investigates the importance of early life work experiences in shaping the labour market outcome in later life.

2.3.1 Ascribed status

Ascribed status is the social status that a person is assigned at birth or that is assumed involuntarily later in life, such as age, sex, race and kinship. Ascribed status has a continuous influence on an individual's motivations and opportunities to remain in the labour market (Flippen and Tienda, 2000). Within existing literature, age and gender are the most frequently discussed ascribed status that shapes labour market behaviour. Race or ethnicity is another important ascribed status in international literature (Vlachantoni *et al.*, 2017), although less attention has been paid to the ethnic differences in labour market participation in later life. However, race as a discriminator is less relevant in the Chinese context.

2.3.1.1 Age

The definition of 'the age effect' is the irreversible effect that persons of specific age will normally experience (Alwin and McCammon, 2003). In other words, the age effect is the consequence of growing older. The age effect should be distinguished from the cohort effect in literature (see Section 2.2), which is the experiences that members of a specific birth cohort share throughout their lives (ibid). In terms of the age effect on labour market behaviour, there is a consensus in the

research that the probability of labour force participation decreases with advancing age in general (Dahl *et al.*, 2000; Humphrey *et al.*, 2003; Börsch-Supan and Alcser, 2005).

The chronological age of an individual is a determinant of many personal characteristics, and thus the age effect on labour force participation is can be a comprehensive outcome that is related multiple aspects. For example, the increasing age can lead to the deterioration of health status as well as the eligibility of claiming pension benefits, both of which can result in a lower probability of continuing to work in later life (e.g. Disney et al., 2006; Berkel and Börsch-Supan, 2004; see Sections 2.3.2 and 2.3.4).

The change in the individuals' self-identification of work is another important explanation of the age effect regarding labour market behaviour. According to Solinge and Henkens (2007), individuals have an awareness of their own position in the social timetable and make decisions based on their awareness of approaching the 'right' timing or 'age deadline' for life events. Thus, their expectations about appropriate timing can affect their labour market behaviour as they grow older. A few studies have provided supportive evidence on the age effect in relation to subjective evaluation of work. For instance, the work of Phillipson and Smith (2005), using data from the English Longitudinal Study of Ageing, suggests that there are changes in work expectations with increasing age. The expectations of work remain strong amongst individuals in their fifties but there is a significant increase in the expectations of retirement for those in their early sixties. Similarly, the work of Desmette and Gaillard (2008), which was conducted with a small sample population (respondents working in private organisations in Belgium), shows that self-categorisation as an 'older' worker was related to negative attitudes toward work and a strong desire to retire early.

In terms of studies in the Chinese context, the association between an increasing age and a lower probability of labour force participation is confirmed as well (Du, 2009; Giles *et al.*, 2011; Liao, 2012). The mechanism of the age effect via other personal characteristics (such as health status and pension benefits) has been discussed (Feng and Hu, 2008; Zhang, 2010). The major limitation in the Chinese context is the limited attention paid to the importance of the subjective values and options of older adults in explaining the age effect on the labour market outcome in later life.

2.3.1.2 Gender

The gender differences in labour market behaviour have been intensively researched. A large number of cross-sectional studies have identified the lower labour force participation of women at one point in time as the main feature of the gender differences in most countries worldwide (Bloom *et al.*, 2009). An increasing body of recent studies have shown that the gender differences

continue over the life course - the work trajectories of women generally feature a lower continuity of work, including late entry into the labour market, more interruptions in the middle of their career lives and a higher proportion of part-time work at particular stages across their working lives (Han and Moen, 1999; Pollock *et al.*, 2002; Levy *et al.*, 2007; Ho and Raymo, 2009; Wahrendorf, 2014; McMunn *et al.*, 2015; Van der Horst *et al.*, 2017).

Similar to the age effect, gender differences can result from the variations in personal characteristics which shape labour market behaviour heavily. For instance, Radl (2013) argues that women's lower labour force participation is largely related to their lower social positions. Yet, the majority of research links women's lower labour force participation to the intensive family obligations they undertake (e.g. Gomez-Leon *et al.*, 2017; see Section 2.3.5.3). Empirical results using retrospective data show that women adjust their occupational pathways to facilitate their family roles such as being mothers and caregivers over the life course (Levy, Felix and Widmer, 2007; Pollock, 2007; Widmer and Ritschard, 2009; McMunn *et al.*, 2015; Van der Horst *et al.*, 2017).

The gender differences concerning the division between work and family responsibilities in many European countries reflect the prevalence of the 'modified male breadwinner' model – where both genders earn money to support the family but women usually take more domestic work. Married women give family responsibilities a higher priority than work when making occupational and familial decisions at the same time (Pienta, 2003; Loretto and Vickerstaff, 2012). The study of Pavalko and Artis (1997) provides convincing evidence on the causality between work and family roles. Using data from the National Longitudinal Survey, this study shows that the causal relationship between employment and care provision was unidirectional amongst women in the US – women reduced their working hours in order to meet caregiving demands but not vice versa. Due to such gender differences, women are more likely to be affected by the negative impact of undertaking family obligations on continuing work and the work intensity, and be disadvantaged in terms of their well-beings (such as financial and health statuses) in later life (e.g. Evandrou *et al.,* 2002, see also Section 2.3.5.3).

The gender differences in the labour market behaviour in the Chinese context are similarly described as lower labour force participation amongst women as compared to men, which is partly related to the lower SPA for claiming pension benefits. However, there have been few discussions on the potential impact of these gender differences for women themselves. An exception is the Chen (2015), which shows that women receive less pension benefits in later life than men due to women's lower SPA and fewer working years. At the same time, there are few

discussions on the gender differences in relation to the division between work and family responsibilities amongst older adults, a point to which the author returns in Section 2.3.5.3 below.

2.3.2 Health status

The association between health status and labour market behaviour in later life has been intensively studied. Health status can be defined as the state of the combination of physical, mental and social well-being (WHO, 1948). Within the topic of labour market behaviour, health status is measured by different indicators, such as the self-assessed health levels, the existence of activities of daily living (ADL) or instrumental activities of daily living (IADL) difficulties and the presence of specific disease(s) (Flippen and Tienda, 2000; McGarry, 2004; Tian, 2010).

The deterioration of health can result in limitations concerning individuals' capacity to carry out daily activities, which further lead to adjustments or the cessation of work due to the difficulty of continuing to undertake a workload at previous levels (Bound *et al.*, 1999). There is considerable empirical evidence that poor health status acts as one of the main constraints on labour force participation and lowers the probability of staying in the labour market in many Western countries (Bound *et al.*, 1999; Dwyer and Mitchell, 1999; Flippen and Tienda, 2000; Mein *et al.*, 2000; Campolieti, 2002; Han Au *et al.*, 2005; Cai and Kalb, 2006; Roberts *et al.*, 2010; Finch, 2014). In addition, the impact of health status is reported to be larger for lower skilled workers and lower social classes as their work positions require higher physical conditions than others (Wilson, 2001; Radl, 2013; Li, Zhao and Lei, 2014).

Additionally, a large body of research has paid attention to the possible effect of using different indicators as the proxies of health status on the interpretations of the causality between health status and labour market behaviour. In the pioneering work of Bound *et al.* (1999), the author argues that the simple application of the self-rated health conditions may fail to reflect the full scale of the influence of health on labour force participation – the main reason is that people may alter their responses to the self-rated health conditions due to psychological and economic incentives. On the one hand, individuals can use their health status as a justification for staying in or out of the labour market, and exaggerate (or downplay) their health problems according to their attitudes toward labour force participation (McGarry, 2004). On the other hand, people may have economic incentives to report worse-than-actual health status, such as claiming for disability retirement benefits (Campolieti, 2002).

Compared to the self-rated health status, objective measurements of health status are more impersonal and reliable. A wide range of objective health measurements have been used, with the existence of ADL and IADL difficulties as the major one (Dwyer and Mitchell, 1999; Wilson,

2001; McGarry, 2004; Han Au et al., 2005; Miah and Wilcox-Gok, 2007). Nevertheless, there is the critique that these measurements are not necessarily correlated with the aspects of health that affect the individuals' capacity to work and the application of them can produce measurement bias (Roberts, Rice and Jones, 2010). In fact, as Kalwij and Vermeulen (2007) argue, researchers usually face a trade-off in the application of either indicator as both of them may lead to biased estimations.

The negative association between health status and labour market participation in China is found within studies using nationally-representative data (Tian, 2010; Zhang, 2010; Zhang, 2011a; Giles *et al.*, 2011; Zhang *et al.*, 2013). The impact of health status is more pronounced amongst rural residents, which can be explained by the heterogeneity in the labour market between urban and rural areas (Giles *et al.*, 2011; Zhang, 2011; Li *et al.* , 2014).

2.3.3 Available financial resources

This section discusses the impact of individuals' financial resources on labour market behaviour. As income and assets are two important parts of the composition of individuals' financial resources (Smeaton and McKay, 2003), this section focuses on the impact of non-work income streams (e.g. short-term investments) and typical household assets (e.g. property ownership and the access to car). Out of the wide range of work and non-work income streams, pension benefits are recognised as the most important income source of older adults in later years (Ginn and Arber, 1999; Coile and Gruber, 2000); the impact of the receipt of pension benefits is discussed separately in Section 2.3.4.

The adequacy of financial resources in later life is an important consideration concerning the labour market decisions in later life (Li *et al.*, 1996; Oakman and Wells, 2013). Theoretically, sufficient financial resources provide individuals with the ability to afford their living expenses and to support themselves when leaving the labour market and when they are no longer receiving an income from employment. In contrast, limited financial resources can keep individuals in the labour market out of necessity. The empirical results have confirmed there to be a relationship between financial resources and labour force participation in later life (Blundell, Meghir and Smith, 2002; Humphrey *et al*., 2003; Spiess and Schneider, 2003; Schils, 2008; Radl, 2013). Various measurements of financial resources were employed amongst these studies, including social classes (Schils, 2008; Radl, 2013), wealth (Blundell *et al.*, 2002), income (Spiess and Schneider, 2003; Han Au *et al.*, 2005) and housing tenure (Humphrey *et al.*, 2003).

Notably, the impact of education on labour market behaviour is complicated. On the one hand, as an important indicator of socioeconomic status, higher educational attainment is related to higher

wages, better career positions and sufficient financial resources, all of which facilitate the option of leaving the labour market (Schils, 2008; Giles *et al.*, 2011). However, many empirical studies have reported an opposite direction between education and labour force participation. For example, the study by Van Bavel and De Winter (2013), using 11,299 cases within twenty-two European countries from the European Social Survey, shows that respondents with higher educational attainment are less likely to proceed to retirement. Similarly, the work of Smeaton and McKay (2003) shows that having any educational qualification is associated with working after reaching the SPA, whilst having no educational qualifications was associated with leaving work earlier. One common explanation to this association, which is provided by these studies, is that people with more human capital investment (higher educational levels) are more likely to extend their working lives as they attempt to take full advantage of their human capital and to pay back the opportunity cost of their early career years.

The association between the sufficiency of financial resources and labour market behaviour within the Chinese context varies with the application of different indicators. First, concerning the impact of educational attainment, studies in the Chinese context have shown that people with higher educational attainment are more likely to stay in the labour market, which is similar to findings in the international literature (Pang *et al*., 2004; Wang, 2011; Liao, 2012; Mou and Song, 2012). The explanations for such an association include the higher opportunity cost of forgoing their present income and the stronger feelings of social participation as an important motivation (Pang *et al.*, 2004; Zhang, 2010). Second, concerning the impact of wealth, the work of Giles *et al.* (2011) shows that the lower values of housing is related to a higher probability of labour force participation amongst older adults in China, using data from the China Health and Retirement Longitudinal Study (CHARLS). In contrast, the work of Liao (2012) claims that there is no influence from household wealth on labour market exit using data from the Chinese General Social Survey, but the author has also found that higher household expenditure is related to a lower probability of leaving the labour market. Third, concerning the impact of income, the work of Benjamin *et al.* (2003) reports that the low household income is an important reason for many elderly to continue working through old age. However, the work of Pang *et al.* (2004) show the impact of the indicator of income per capita on the labour force participation of older adults is not statistically significant. These different results highlight the importance of using suitable indicators to measure individuals' financial status in the Chinese context.

2.3.4 Pension benefits and the public pension system

As an important financial resource in later life, pension benefits allow older adults to support themselves financially after they leave the labour market. Existing studies have shown that the

receipt of pension benefits is related to a much lower probability of labour force participation in later life (Dahl *et al*., 2000; Smeaton and McKay, 2003; Vickerstaff and Cox, 2005; Roberts, Rice and Jones, 2010; Radl, 2013). As a result, a large proportion of respondents leaving the labour around the SPA are observed in most cases, since approaching the SPA is usually accompanied with proceeding to retirement and receiving pension benefits (Heyma, 2004). For example, the majority of male employees in OECD countries left the labour market around age 65, whilst the typical age for female employees to leave the labour market is between ages 60 and 65 – such differences correspond to the different settings of the SPA for men and women (Van Bavel and De Winter, 2013; Audino and Mason, 2017).

While the availability of pension benefits is critical to the labour market decisions in later life, individuals will evaluate their gains at different time points in order to choose the best time to proceed to retirement as well. A group of studies in economics specifically focus on the impact of the calculation methods of pension benefits on the timing of retirement. The commonly used method by these studies is to calculate the discounted present value of gains from proceeding to retirement at a certain age. These studies provide consistent evidence that the public pension systems in OECD countries discourage working at older ages because the increase in pension benefits from additional working years is insufficient to cover the pension contributions after the SPA. Such a distortion of the pension benefits can greatly drive down the labour force participation of older adults (Blöndal and Scarpetta, 1999; Coile and Gruber, 2000; Gruber and Wise, 2002; Duval, 2003; Berkel and Börsch-Supan, 2004). For instance, the work of Berkel and Börsch-Supan (2004) shows that the calculation of pension benefits in Germany was age-neutral until the 1990s and led to an implicit tax on continuing to work and an early retirement; in contrast, changes in the base early retirement age and the related calculation of benefits raised the average effective retirement age for men by almost 2 years. The work of Duval (2003) has found similar situations amongst OECD countries – the implicit taxes on continuing to work had sizeable effects on the departure of older male workers from the labour force and past changes in implicit tax rates and standard retirement ages explain about one-third of the decline in older male labour force participation over the last three decades.

In addition, the availability of alternative programmes to standard retirement also influences the pathways and the timing of labour market exit. The convenience of getting access to other retirement programmes or social transfer programmes, such as disability retirement and the unemployment programme, encourages early labour market exit. The work of Schils (2008) shows that individuals in countries with high flexibility and generosity in terms of early retirement are more likely to be encouraged to do so. The work of Siegrist and Wahrendorf (2010), using data from the Survey of Health, Ageing and Retirement in Europe, shows that the generous early

retirement provisions by the social security system do not only make voluntary early retirement more attractive for individuals but also induce firms to encourage more of their employees to retire early.

To conclude, relevant literature in Western contexts reflect that the SPA, the calculation method of the pension benefits and the availability of alternative pathways to retirement are all important elements of the public pension system that matter to labour force participation. Relevant studies in the Chinese context emphasis the role of having access to pension benefits in facilitating labour market exit as well. Similarly, empirical evidence haven shown that a large number of older adults choose to leave the labour market at the SPA (Feng and Hu, 2008; Giles, Wang and Cai, 2011). The work of Wang and Zeng (2004), using the administrative data from the Ministry of Human Resources and Social Security, provides further evidence that proceeding to retirement once it is eligible to do so is the most beneficial for employees under the current pension policies.

In addition, the influence of the New Rural Social Pension Programme (NRSP) has received significant research attention. A series of studies have found consistent findings indicating that receiving benefits from the NRSP is reported to relate to decreased working hours and higher chances of leaving the labour market, using national-represented data such as the CHARLS (Zhang, 2010; Chen *et al*., 2014; Zhang *et al.*, 2014).

2.3.5 Family factors

2.3.5.1 Marital status

Previous empirical research has shown that older people who are married are more likely to work than those of other kinds of marital status in Western countries (Pienta, 1999; Flippen and Tienda, 2000; Smeaton and McKay, 2003; Phillipson and Smith, 2005; Whiting, 2005). For instance, the work of Whiting (2005), using data from the Labour Force Survey, shows that older people who are married or cohabiting are also more likely to be in employment than people with no partner in the UK. The work of Mein *et al.* (2000), using results from a first-hand longitudinal survey of civil servants in London, shows that married couples are more likely to work based on them being more likely to have dependants.

Specifically, a large body of literature concentrates on the impact of marital status on women exclusively (Sefton *et al.*, 2011; Finch, 2014; Damman *et al.*, 2015). These studies attach importance to the financial resources that are rooted in marital status. Women who are divorced or who have never married are found to be at disadvantage in terms of financial status due to their lower chances of sharing their husbands' pension benefits, which limit the possibility of an

early labour market exit for them compared to dual-earner couples and those who are widowed (ibid). For example, the work Damman *et al*. (2015) presents evidence concerning the influence of marital history on women, using 420 cases from the Netherlands Work and Retirement Panel Data. The results show that divorced single women left the labour market later than continuously married women, but partnering after a divorce offsets the negative divorce effect and the labour market exit of re-partnered women does not differ from that of the continuously married women.

Additionally, the tendency towards joint retirement for couples has been found in existing literature. Empirical evidence has shown that the labour force participation of those married individuals is related to the working status of their spouses in the US and European countries and the preference for enjoying leisure time with spouses when planning to retire is a common explanation for the propensity towards joint retirement (Hurd, 1990; Blau, 1998; Gustman and Steinmeier, 2000; Michaud, 2003; Whiting, 2005; Schils, 2008).

Regarding the relevant literature in the Chinese context, being married has been found to be related to a higher probability of labour force participation compared to other marital status (Pang et al., 2004; Mou and Song, 2012; He and Wang, 2015). Specifically, the work of Giles *et al.* (2015), using data from the CHARLS, confirms that the work status of couples is strongly correlated with each other in both rural and urban areas.

2.3.5.2 Intergenerational material transfers

The material transfers beyond nuclear households, especially between generations, can work as financial barriers to the labour market exit of older adults as older adults may continue working in their later years in order to maintain the financial transfers to their children (Pienta, 1999; Svensson *et al.*, 2015). For example, individuals who have made financial contributions to children outside of the household in the US are more likely to work than their counterparts (Szinovacz *et al.*, 2001), and the financial obligation of supporting children through university is a key determinant of late retirement in the UK (Loretto and Vickerstaff, 2012).

Given these examples, the opposite situation, i.e. the material transfers from family members, may work as an additional income source and facilitate labour market exit. Empirical evidence has shown that there is frequent material support from migrant workers to their families (Antman, 2010; Knodel *et al.*, 2010), but less research attention has been paid to the impact of the material support to the labour force participation of the left behind family members.

Given the norm of family reciprocity in the Chinese context (see Section 1.5), it is important to examine the importance of intergenerational material transfers in the Chinese context. Similar to the international literature, more domestic research is about the material transfers per se, but

not the impact of of the material transfers on labour market behaviour (Cong and Silverstein, 2008, 2011; Guo *et al*., 2009). The work of Wang (2011) is an exception, which shows that the parents of children who have an illness or who are disabled are more likely to work due to higher financial demands. However, this work is based on a first-handed survey of 976 parents of single children in Shanghai and thus the findings may only apply to a small group within the country.

2.3.5.3 Informal care provision to family members

Informal care is generally defined as the unpaid caregiving that is often provided by family members to the recipients with whom they have close personal relationships (Lilly *et al.*, 2007; Nguyen and Connelly, 2014). The prevalence of informal care within families has resulted in an increasing trend of multiple role occupancies for individuals who undertake care provision and paid work at the same time in many developed countries (Evandrou and Glaser, 2004; Colombo *et al.*, 2011). The care provision to grandchildren from grandparents is found to be prevalent in many countries and has received increasing research attention recently (Hochman and Lewin-Epstein, 2013; Van Bavel and De Winter, 2013). For example, it has been shown that one-fourth of working families and one-third of working mothers were using grandparents for childcare in the UK (Department for Work and Pensions, 2014).

Following the role conflict theory (see Section 2.4), many studies have hypothesised that the informal care provision to family members exerts a negative impact on employment, since the competing pressure of the caring role sets constraints on the time allocation between work and family responsibilities (e.g. Dentinger and Clarkberg, 2002). However, there are mixed results on the association between informal care and labour force participation. While some studies confirmed that the care provision to family members encourages the labour market exit of individuals in later life (Johnson and Lo Sasso, 2000; Spiess and Schneider, 2003; Pavalko and Henderson, 2006; Bolin, Lindgren and Lundborg, 2008; Ciani, 2012; Gomez-Leon *et al.*, 2017), some others has only found there to be a negative impact from care provision on the working hours instead of the complete cessation of work (Dautzenberg *et al.*, 2000; Casado-Marín *et al.*, 2011; Meng, 2013).

Notably, much of the work on this topic indicates that the negative impact of care provision is more pronounced amongst women. For example, the work of Dentinger and Clarkberg (2002) presents evidence in the context of the US, that wives taking caring for their husbands have a much higher probability to proceed to retirement than women who are not caregivers, whereas husbands caring for their wives are substantially slower to retire. Similarly, the work of Heitmueller (2007), using data from the British Household Panel Survey, shows that the presence of young children reduces the labour force participation rates of women significantly but has no

impact on males. These examples are in consistent with the 'modified male breadwinner' model discussed in Section 2.3.1.2, highlighting that women are more likely to take family responsibilities and more likely to be negatively affected.

A few studies have investigated the impact of care provision of different intensities (Carmichael and Charles, 1998, 2003; Heitmueller and Inglis, 2004; Berecki-Gisolf *et al.*, 2008; Lilly, Laporte and Coyte, 2010; King and Pickard, 2013; Jacobs *et al.*, 2014; Nguyen and Connelly, 2014). With different thresholds used to identify the minimum level of care provision, which usually vary between 10 to 20 hours per week, these studies provide consistent results, stating that only high-intensity care provision (or being a primary caregiver) has a negative influence on labour force participation. Yet, all of these studies indicate that caregivers are disadvantaged with fewer working years and fewer years of contributions to the pension schemes due to the care provision, and suffer from both a 'wage penalty' during working life and a 'pension penalty' in later life (Evandrou and Glaser, 2003; Heitmueller and Inglis, 2004; Bolin *et al.*, 2008).

In contrast to the discussions of care provision of different intensities, the work of Hassink and Van den Berg (2011) suggests hat the type of care provision (instead of just the hours spent on care provision) matters to labour force participation and the influence of different types of caring tasks can be divergent. The authors have explained that some caring tasks require a larger time commitment and additional opportunity costs as they must be performed at a relatively fixed time of the day, whilst other care tasks are not fixed and can be performed on a more flexible schedule (e.g. providing assistance with eating and dressing compared to household chores). In consistent with this argument, the work of Van Houtven *et al* (2013), using longitudinal data from the Health and Retirement Study, shows that only men who provided personal care and women who provided chore assistance are less likely to stay in the labour market in the US. Similarly, the work of Gomez-Leon *et al.* (2017) shows that the negative impact of on care provision both the labour market exit and the work intensity varies by the types of caregiving, which also also differs across men and women.

In addition, the impact of informal care provision on labour market behaviour also varies according to the living arrangement between the caregivers and care recipients (i.e. whether co-resident with each other) (Ettner, 1995, 1996; Pezzin and Schone, 1999; Carmichael and Charles, 2003; Casado-Marín *et al.*, 2011). For example, the work Carmichael and Charles (2003) shows that the main caregivers inside the household are highly negatively related to labour force participation but the main caregivers outside of the household are influenced to a much smaller extent, using data from the General Household Survey in the UK conducted in 1990. The study by Heitmueller and Michaud (2006), using data from the British Household Panel Survey,

demonstrates that the negative influence of care provision on labour market participation is insignificant across both genders but becomes significant when only the subsample of co-resident caregivers is examined. Heitmueller (2007) reports that the caregivers who co-reside with the care recipients are much less likely to work in the UK but no relationship is observed when the care recipient and caregiver did not live together. Given these examples, co-residence appears to be a mode of assistance that implicitly refers to intensive care provided by individuals due to proximity in Western contexts and indicates the larger negative impact of care provision.

The author is interested in the impact of care provision on the labour market behaviour of older adults in the Chinese context. As discussed in Section 1.5, the (material and time) exchange between family members are shown to be frequent (see Section 1.5), and the care provision to other family members can be an important part of the life of those in pivotal family positions. For example, the work of Falkingham *et al.* (2019) shows that mid-life individuals in China (aged 45 to 60) provide intensive upstream care provision to parents (and parents-in-law) and downstream care provision to children, and are usually 'sandwiched' by the demands of older parents and grandchildren at the same time.

Nevertheless, the negative impact of care provision on the labour market behaviour of older people is less studied in the Chinese context – much of the work of this topic focuses on women's employment and the competing demands of care provision between children and older parents that they confront. The scarcity of relevant literature highlights the importance of investigating the influence of care provision to labour market behaviour, especially the influence of the skip-generation care to grandchildren. One exception is the work of He and Wang (2015) – using data of the baseline wave from the CHARLS, this study shows that the care provision to grandchildren is related to a lower probability of staying in the labour market. Based on this piece of work, this thesis further tests the impact of care provision using longitudinal data.

2.3.6 Early life work experiences

Most of the studies that have been discussed in Section 2.3 so far have paid attention to the proximate conditions around the labour market decisions. The life course perspective provides new insights into the understanding of the impact of past experiences on the labour market behaviour in later life (see Section 2.4). A growing body of empirical evidence in wider contexts has confirmed the association between the variations in work trajectories and the outcomes in later life, such as the quality of life, financial status, the access to pensions and medical care and the timing of retirement (Han and Moen, 1999; Sefton *et al.*, 2011; Wahrendorf, 2015; Stone *et*

al., 2015; Scherger *et al.*, 2016b). These studies have shown that the impact of past experiences is accumulated, which is not limited to the realm of labour market behaviour.

Relevant literature has suggested there to be several links between the characteristics of work trajectories and the labour market outcomes in later life. Firstly, the continuity of employment is found be to related to the labour market behaviour in later life and *any* inactivity within the work trajectories is shown to be a predictor of a lower probability of working in advanced ages (Pienta, 1999; Raymo *et al.*, 2010; Lyberaki *et al.*, 2013; Finch, 2014). Two major explanations have been provided for such associations. One explanation is that discontinuous work histories lead to a lower probability of finding another work opportunity and a higher probability of unemployment in later life (Flippen and Tienda, 2000). The other explanation is that work histories reflect individuals' priorities between work and family goals. The work-oriented individuals (with continuous working histories) tend to maintain their state of working in later life while those with interruptions in work histories tend to pursue other interests (Finch, 2014).

Secondly, part-time work experiences are shown to be related to late labour market exit (Han and Moen, 1999; Pienta, 1999; Lyberaki et al., 2013; Finch, 2014; Scherger et al., 2016; Birkett et al., 2017). The episodes of part-time work over the life course can result in reduced savings and pension provisions in later life (Evandrou and Glaser, 2003), which may further lead to involuntary stay in the labour market. The work of Finch (2014) also points out that women have a higher tendency towards longer stay in the labour market in late life since women are more likely to have part-time work than their male counterparts (see also Section 2.3.1.2). These results indicate that the impact of work trajectories is accumulated over the life course and is relevant to different life domains in later life, including the financial well-being and labour market behaviour (Sefton *et al.*, 2011).

Thirdly, the experiences of self-employment lower the probability of leaving the labour market in later life (Hayward *et al.*, 1998; Pienta, 1999; Bardasi *et al.*, 2002). Empirical evidence has suggested that self-employment demands greater personal investment in private pensions than other types of paid work, since the self-employed are generally not eligible for social security or early retirement schemes, and therefore have to rely fully on their privately organised financial arrangements (Schils, 2008; Finch, 2014; Scherger *et al.*, 2016). Results here indicate that the impact of work trajectories on the labour market outcome in later life is closely related to the public pension system as well.

On the other hand, these empirical findings underline that the trajectories from the work and family domains are intertwined, which means family trajectories can have an accumulated impact on the following labour market outcome in later years as well. For example, the delay of

childbearing, as an important decision within the family domain, is found to increases the probability of women remaining in the labour force during their later years compared to those who complete their family early and the childless (Pienta, 1999; Finch, 2014).

Within the Chinese context, little is known about the impact of work trajectories on the labour market outcomes in later life for older adults. In fact, as discussed earlier, the research attention on the patterns of the work trajectories per se is also limited, which is in part due to the lack of data. The research gap within the understanding of the work trajectories of older adults in China calls for a detailed investigation on the association between work trajectories and the labour market behaviour in later life in this thesis.

2.4 Key theories that underpin existing literature on the investigation of labour market behaviour

This section introduces the key theories concerning the factors influencing individuals' labour market behaviour in later life, which underpin the existing empirical research discussed in Section 2.3. Three theories are discussed: the life course perspective which focuses on the long-term impact of life trajectories), the role conflict theory which provides more specific explanations on the associations between individuals' own decisions and their interaction with family members, and lastly the pull and push factors hypothesis which provides a more general framework for understanding the impact of different factors. The important insights provided by these theories on the conceptual framework developed in this thesis are further discussed in Section 2.5.

2.4.1 Life course perspective

The life course perspective is one of the most frequently cited perspectives in the study of ageing in social science (Bengtson *et al.* , 2005). Elder, one of the pioneers that develop the life course perspective, identified the life course perspective as a paradigm with several important disciplines (Elder *et al.*, 2003). An important discipline of the life course framework is that earlier life stages have accumulative consequences for circumstances in later life (ibid); in other words, individual decisions are not only based on the proximate situations around the time point of decisions but also on the experiences that continue over the life course. Thus, the pathways of work experiences matter to the understanding of the labour market outcome in later life. The importance of life trajectories in affecting outcomes in later life has been confirmed by a large body of literature (e.g. Wahrendorf, 2015, see Section 2.3.6).

Another important discipline of the life course perspective, which is relevant to this thesis, is the linked lives principle. This principle underlines that individual decisions are embedded in family contexts and are influenced by the interactions with other family members (Bengtson, *et al.*, 2005). Following this principle, the impact of family relationships on the labour market behaviour in later life can be critical. For example, the transition to a new phase in the life course, such as grandparenthood, can shape individuals' identities of family and their work orientations (Hochman and Lewin-Epstein, 2013). The family ties can be especially important for older adults who are approaching the end of the working lives, since their relationships with colleagues tend to become less frequent (Szinovacz *et al.*, 2001; Solinge and Henkens, 2007).

The life course perspective contribute to the understanding of labour market behaviour within existing literature from two aspects. On the one hand, it highlights the importance of work trajectories in explaining the link between past experiences and outcomes in the later life, which leads to research attention to different time points over the life course (e.g. Wahrendorf, 2015, see also Section 2.3.6). On the other hand, it emphasises the importance of the interactions with family members in explaining individuals' labour market behaviours in later life as well as the link between work and family domains concerning the crucial labour market decisions made in individuals' lives (Börsch-Supan *et al.*, 2013).

2.4.2 Role conflict theory

The role conflict theory states that requirements for different roles might compete for a person's limited time and participation in one role can make it difficult to fulfil the requirements of another (Greenhaus and Beutell, 1985). For older adults, there can be potential conflicts in the allocation of time between work and family roles for individuals. This conflict can lead to a decline in the ability to assign tasks or even the failure to achieve minimum requirements at work. As a result, family obligations may reduce the working hours as well as the probability of labour force participation.

There is a large body of literature investigating the level of conflicts between different roles, especially on the role of caregivers amongst older adults (e.g. Gomez-Leon *et al.*, 2017, see Section 2.3.5.3), and the potential conflict between different work and family roles varies from a significant impact to a relatively small influence. These results indicate that the impact of the behaviours within the family domain on the decisions within the work domain should be examined more specifically. Taken this theory into account, the conceptual framework developed in this thesis pays particular attention to the interaction between work and family roles, where

the competing pressure of caring roles is likely to set constraints on the time allocation between work and family responsibilities in later life (see Section 2.5).

2.4.3 Pull and push factors hypothesis

The pull and push factors hypothesis has a wide application across social contexts for demonstrating factors associated with individuals' decisions of doing something, such as migration (Pânzaru and Reisz, 2013) and choice of study destination (Mazzarol and Soutar, 2002). The framework has a direct application on analysing the correlates with labour market outcomes from different aspects across contexts (Shultz *et al.*, 1998; Dahl *et al.* , 2000; Phillipson and Smith, 2005; Schils, 2008; Radl, 2013).

The pull and push factors hypothesis distinguishes between favourable conditions that encourage changes in the outcome (defined as pull factors) and negative circumstances that restrict the continuation of the current outcome (defined as push factors).

Concerning the labour market decisions, some factors are more likely to be incentives of leaving the labour market while some are more likely to act as constraints on staying in the labour market. For example, the health status of older adults has a tendency towards deterioration as they grow older and is more likely to be a push factor that stops people from prolonging working lives. Similarly, macro-factors such as higher local unemployment unemployment rates and economic recessions are more likely to be push factors that defer individuals from remaining in the labour market as well (Dahl, Nilsen and Vaage, 2000; Meschi, Pasini and Padula, 2013; Radl, 2013).

2.5 Conceptual framework for this thesis

Based on the theoretical and empirical evidence which has been presented in this chapter so far, the author developed the conceptual framework on the understanding of labour market behaviour of older adults, which is shown in Figure 2.1. The focus of this conceptual framework is to explain the labour market behaviour in later life – which is shown as a dot in Figure 2.1.

Based on existing empirical results, this conceptual framework includes the factors influencing the labour market behaviour in later life from four different levels, i.e. individual characteristics, family characteristics, past experiences and the institutional background. This is shown by the arrows that connect the explanatory variables with the outcome variable. Specifically, the impact of the institutional background is embedded in characteristics from the other three dimensions; such a relationship is shown as dotted arrows in Figure 2.1. The conceptual framework focuses on

the different roles these factors may play in explaining the labour market behaviour in later life – in other words – whether they work as incentives or constraints for the labour market outcome in later life. Such a distinction is in consistent with the pull and push factors framework.

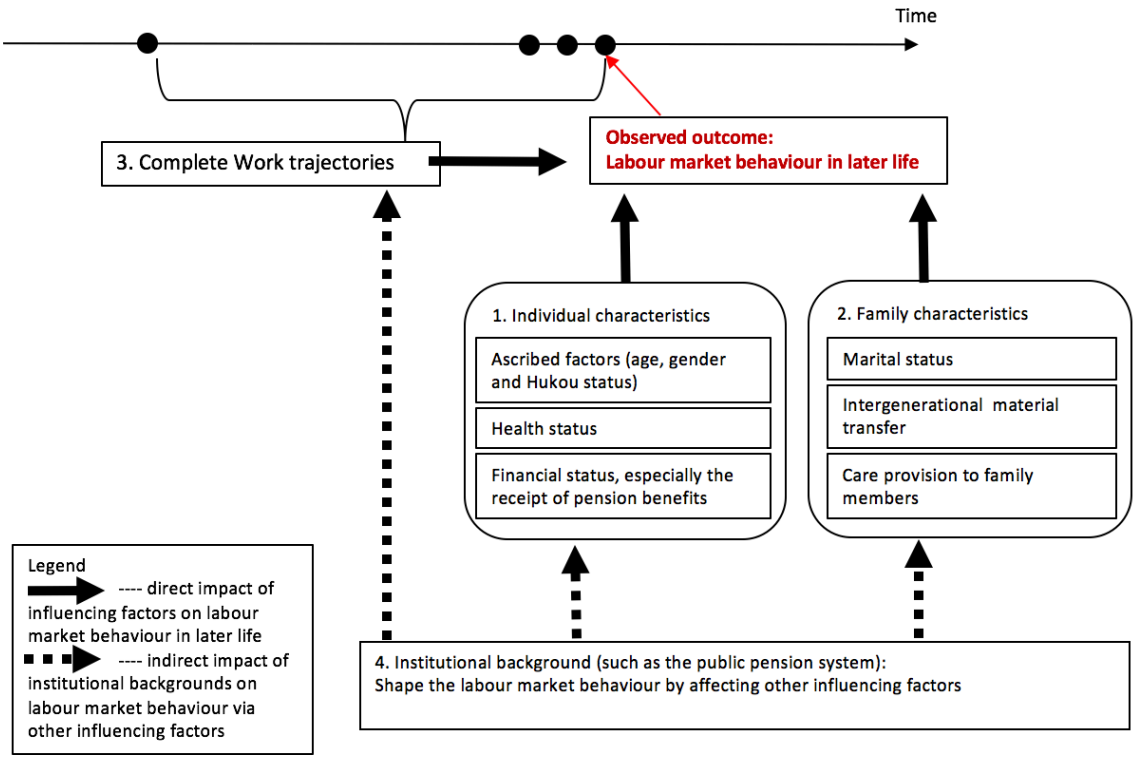
The first group of factors influencing the labour market behaviour in later life is individual characteristics. Corresponding to the discussions in Sections 2.3.1 to 2.3.4, individuals' ascribed status (age, gender and Hukou), health status, financial status and receipt of pension benefits are considered as potential factors that influence the labour market behaviour in the Chinese context.

The second group of factors is family characteristics. As discussed in Section 2.3.5, empirical results have attached importance to the impact of marital status, intergenerational material transfers and informal care provision to other family members on the labour market behaviour in later life. Besides that, the role conflict theory and the linked lives principle of the life course perspective have presented theoretical support to underpin these studies. All of these three aspects are discussed in this thesis, since the important of family characteristics has received scant research attention in the Chinese context and a further understanding on their interplay with labour market behaviour is required.

The third aspect is the long-term impact of work trajectories on the labour market behaviour in later life. This point of view is supported by the key principle of the life course theory that earlier life stages have consequences for later life relationships (see Section 2.5). Specifically, the accumulated impact of the continuity of employment, the economic activities and work intensity is discussed in this thesis, which has been confirmed in existing literature (see Section 2.3.6).

Notably, Figure 2.1 shows that the work trajectories are constituted by single events of labour market behaviour and multiple transitions of labour market behaviour. In this sense, the patterns of the labour market behaviour of older adults and the factors influencing labour market behaviour are related to each other. On the one hand, by showing the variations in labour market behaviour between different social groups and changes in labour market behaviour, the knowledge on the patterns of labour market behaviour sheds lights on the potential factors that influence the labour market behaviour in later life. On the other hand, the analysis on the factors that influence labour market behaviour provide us with a further understanding of the cause of the heterogeneity in the labour market behaviour.

Figure 2.1 Conceptual framework to understand the factors influencing the labour market behaviour in later life



Source: Author's own analysis.

The final aspect is the impact of the institutional background. Such an impact is embedded in the influential factors from the other three dimensions and it takes effect by mediating these factors. Concerning the labour market behaviour, the most important institutional background that is discussed in this thesis is the public pension system. Besides that, other important backgrounds such as the support from the federal childcare system are also investigated when relevant.

Last, it is worth pointing out that these potential influencing factors at different levels are usually intertwined and associated with one another. For example, while both health status and care provision can influence the labour market decisions in later life (see Sections 2.3.1.3 and 2.4.3), the health status of individuals and their ability to provide informal care to other family members are also inter-related (Van Houtven and Norton, 2004; Bauer and Sousa-Poza, 2015; Vlachantoni *et al.*, 2016). These results underline that researchers should carefully distinguish the impact from various factors regarding the labour market outcome.

2.6 Chapter summary

In order to achieve a comprehensive understanding of the labour market behaviour of older adults in the Chinese context, this chapter reviews existing literature on the topic of the labour market behaviour in later life, including the patterns of the labour market behaviour of older adults and the factors influencing their labour market behaviour.

Concerning the patterns of labour market behaviour, increasing attention has been paid to the group of older adults, especially their work trajectories over the life course as opposed to early studies on the labour force participation at a point in time or a single transition. The heterogeneity in the labour market behaviour between groups and the changes in labour market behaviour across cohorts are two frequently discussed research focuses.

Concerning the factors influencing the labour market behaviour in later life, this thesis organises existing findings into different themes and discusses the relevant results respectively. The first aspect is the impact of individual characteristics. Age and gender have been shown to be two fundamental ascribed statuses that have an impact on the labour market behaviour in later life. The negative association between labour force participation and increasing age is widely reported, and this can be related to subjective attitudes towards work as well as other factors including health status and pension benefits. On the other hand, gender differences in labour market behaviour over the life course have been found, which are largely related to women's higher involvement in family obligations under the prevalent 'modified male breadwinner' model.

Individual poor health status is negatively related to labour force participation of older adults and it usually works as a constraint that stop people from working.

Favourable financial status is found to facilitate labour market exit as it is usually related to the ability for individuals to make a living without working. The different measurements of financial status reflect a consistent association, except educational attainment.

As an important income source in later life, receiving pension benefits is found to be correlated with significant lower labour force participation. The importance of the receipt of pension benefits underlines the impact of the public pension system on individuals' labour market decisions, where the criteria for pension benefits (the SPA and the years of contribution) and the levels of benefits are all important.

The second aspect is the impact of individuals' interaction with family members. In terms of marital status, the higher labour force participation rates of married individuals and the propensity towards joint retirement of couples are reported. In terms of the material transfers

with family members, they can either works as an additional income source or financial commitments, which influence individuals' financial status and labour market decisions. In terms of the care provision to other family members, the time devotion to other family members is found to be related to a lower propensity of working in generally.

The third aspect is the impact of early-life work experiences. The potential influence can come from the interruptions of work histories, the economic activities (self-employment) and work intensity (part-time work), all of which are shown to be related to late labour market exit.

After the review of existing empirical results, the key theories that underpin these empirical studies are discussed, including the life course perspective, the role conflict theory and the pull-push factors hypothesis. Based on the current knowledge from both aspects, a conceptual framework that incorporates the understanding on both the patterns of labour market behaviour and the factors influencing the labour market behaviour in later life is developed for this thesis. The conceptual framework pays particular attention to three aspects of research gaps that are identified in the Chinese context, including the importance of family characteristics in shaping the labour market behaviour in later life, the understanding of the work patterns over a long period, and lastly, and impact of the work trajectories on the labour market outcome in later life.

Chapter 3 Methodology

3.1 Overview

Chapter 2 has critically discussed the existing research on the labour market behaviour of older adults in China and in the wider international contexts. This chapter discusses the research methods of this thesis in order to address the research questions and to fill in the research gaps identified in Chapter 2.

Table 3.1 provides an overview of the study design of this thesis. This thesis uses quantitative methods and data from the China Health and Retirement Longitudinal Study (CHARLS) for empirical analysis and several different waves of data from the CHARLS were used for the construction of analytical samples. In order to fully address the five research questions on the patterns of the labour market behaviour of older adults (RQs 1 to 3) and the factors influencing the labour market behaviour in later life (RQs 4 and 5), this thesis developed different analytical study samples and used different data analysis strategy in Chapters 4 to 8. Concerning the patterns of labour market behaviour, this thesis starts by looking at the labour force participation at a specific time point, using a single wave from the CHARLS (Chapter 4). The observation period is extended to a four-year period (Chapter 5) and the entire working lives (Chapter 6), where prospective longitudinal data and retrospective data are used respectively. Sample A, B and C were developed and used for each research focus respectively. After this analysis, Chapters 7 and 8 investigate the factors influencing the labour market behaviour in later life. Samples A and B, which are used for descriptive analysis in Chapters 4 to 6, are employed again for the multivariate analysis concerning the labour force participation and the transition into economically inactive status in later life. A series of Multiple Logistic Models are developed, where the impact of individual characteristics, family characteristics and long-term work experiences are analysed.

The details of the study design are discussed in the rest of this chapter. Section 3.2 justifies the choice of using quantitative methods and secondary data for this thesis. Section 3.3 introduces the datasets that support the empirical analysis of this thesis. Section 3.4 introduces the construction of analytical samples in this study and discusses the potential bias issues due to attrition, missing data and sample selection. Section 3.5 addresses the data analysis strategy of this thesis, including univariate, bivariate and multivariate analysis. Section 3.6 discusses the key concepts and measurements of outcome variables and explanatory variables which were employed by in the multivariate analysis. Lastly, Section 3.7 reviews the main components of this chapter.

Table 3.1 Overview of the study design

Research focus	Research question	Research focus	Chapter	Sample	Main techniques
Patterns of the labour market behaviour of older adults	RQ 1	Labour force participation at a specific time point	4	Sample A (Cross-sectional)	Descriptive analysis
	RQ 2	The transition into economically inactive status status status	5	Sample B (Longitudinal)	
	RQ 3	The entire work histories	6	Sample C (Retrospective)	
Factors influencing the labour market behaviour in later life	RQ 4	Correlates of the labour force participation in later life	7	Sample A* (Cross-sectional)	Multivariate analysis
	RQ 5	Predictors of the labour market exit in later life	8	Sample B* (Longitudinal)	

Note: The specific sample sizes of the study samples used for the multivariate analysis in Chapter 7 and 8 are different from Samples A and B as cases with missing values on explanatory variables cannot be included in the models (see Section 3.5.4).
Source: Author's own analysis.

3.2 Study design

This thesis adopted quantitative methods to address these research questions. Since one of the major research interests of this thesis is the correlates and predictors in association with the labour market behaviour of older adults (RQs 4 and 5), quantitative methods are suitable in nature as they feature a positivism paradigm where the testing of causality between different factors is regarded as important (Bryman, 2015). While the mixed methods can be an option, the author chose to utilise pure quantitative methods for extensive data exploration due to the complexity of data used for this thesis and the length of this thesis.

Secondary data were chosen as the source of quantitative analysis in this thesis; the author believes that secondary data suit the research aim much better than primary data for two reasons. The most important reason is that the nationally representative datasets can reflect generalised research outcomes and provide support to the full scope of research interest at the national level (Bryman, 2015). In contrast, primary data collection exercises of a scale suitable for a PhD study are more likely to restricted to certain geographical regions, such as selected cities or certain counties and villages, which may fail to reflect the overall picture of the study population and the diversity within in the population due to the smaller sample sizes (ibid). In this sense, national-representative data are preferable for reflecting the overall situation of the older population in China and delivering valuable policy implications. Moreover, a large sample size

enables further investigations of heterogeneous characteristic amongst subgroups. The other reason is that using pre-collected secondary data saves researchers' time and facilitates concentration on data analysis since collecting data is time-consuming (Bryman, 2015). Due to the complexity of data and the planned data analysis, the author did not collect any supplementary data by herself.

3.3 Data: China Health and Retirement Longitudinal Study (CHARLS)

This section justifies the appropriateness of using data from the China Health and Retirement Longitudinal Study (CHARLS) in this thesis. An increasing number of longitudinal datasets of Chinese residents have become available to the public in recent years, such as China Health and Nutrition Survey (CHNS), China Family Panel Studies(CFPS) and China Household Finance Survey (CHFS); amongst them, the CHARLS suits the research aim very well. The CHARLS is the one of the first data collection project focusing exclusively on older adults in China (adults who are age 45 and older and their partners), and uses multi-stage stratified sampling methods to ensure the collection of a nationally representative sample (Zhao *et al.*, 2011). The CHARLS contains information on respondents' demographic backgrounds, family characteristics, health status, details of work, assets, income and expenditure, and social insurance (ibid); this rich information enables the investigation of a series of potential factors influencing labour market behaviour.

The CHARLS has received ethical approval from Peking University Institution Review Board; the participation of respondents in the survey is subject to informed consent. The research design of this thesis has got approval from the Ethical and Research Governance of University of Southampton as well (Submission ID:20954 and 32118, see Figure B.13, p.247).

The baseline wave (Wave 1) of CHARLS was fielded in 2011 and included about 10,000 households and 17,708 individuals from 450 villages (or communities) (ibid). Respondents are followed and re-interviewed in each following wave at two-year intervals, with refresh and non-response samples entering the survey to deal with attrition as well (ibid). The results of three repeated longitudinal waves (2011, 2013 and 2015, referred to as Waves 1 to 3 in this thesis) are available during the writing process of the thesis.

Apart from the longitudinal waves, the Life History Wave (conducted at 2014) provides life-history information of respondents including education histories, family histories, wealth histories, employment histories and key life events (Zhao, 2015). Despite the recall bias of retrospective data, evidence shows that the accuracy of recalled information is high on socio-demographic conditions and employment histories (Havari and Mazzonna, 2015; Jivraj, 2016). Information in the Life History Wave was collected retrospectively on an annual basis. A life-calendar starting

with the date of birth and including remarkable events in the past life was used in interviews. The use of the life-calendar made it possible to switch from one dimension to another during the interview to facilitate the reconstruction of life history (e.g. changing job before or after the birth of the first child). 'Landmark events' were also used to help the respondents to recall the timing of events (e.g. before or after the death of Chairman Mao). The Life History data has been available since June 2016. All the three longitudinal waves and the Life History data are used in the thesis; the combination of longitudinal data and retrospective data on work histories support this research of labour market behaviour from dynamic and holistic perspectives.

The CHARLS has a strict quality control process of data which is crucial to the validity of data analysis. The survey design of the CHARLS is in accordance with other acknowledged international surveys focusing on older adults, such as the Health and Retirement Survey (HRS), the English Longitudinal Study of Ageing (ELSA) and the Survey of Health, Ageing and Retirement in Europe (SHARE). The CHARLS also follows the similar standard as these surveys in terms of the collection of data. Face-to-face interviews were carried out with the support of CAPI system; after the interviews, the audio records of interviews were checked by the CHARLS team for data quality control.

The CHARLS team has made a significant effort to maintain the responses rates and has received satisfactory response rates so far. The CHARLS team has provided the response rates for the first three waves of data, which is presented in Table 3.2. According to this table, the cross-sectional response rates of these three waves are similar (around 80%) and the longitudinal response rates are higher (around 85%). The CHARLS has slightly higher response rates than other international family surveys (e.g. the HRS) and much higher longitudinal response rates than many domestic longitudinal surveys in China (e.g. the CHNS). Additionally, similar to the experiences of other developing countries, rural residents have much higher response rates than urban residents, which indicates the better representation of rural residents within the CHARLS. Such difference can lead to potential bias in terms of the representativeness of the study samples for older adults in China, which is further discussed in Section 3.4.2.

Table 3.2 Response rates and sample sizes of the data from the CHARLS

		Number of respondents			Response rate (%)		
		Total	Rural	Urban	Total	Rural	Urban
Wave 1 (Year 2011)	Cross-sectional	17,708	10,537	7,171	80.51	94.15	68.63
Wave 2 (Year 2013)	Cross-sectional	18,264	10,950	7,314	82.63	91.74	72.20
	Longitudinal	15,196	9,439	5,757	88.30	92.18	82.16
Life History Wave (Year 2014)	Cross-sectional	20,547	12,297	8,250	78.27	91.96	66.69
	Longitudinal	14,481	9,187	5,294	85.76	91.44	77.43
Wave 3 (Year 2015)	Cross-sectional	21,095	14,474	6,621	N/A	N/A	N/A
	Longitudinal	14,059	8,780	5,270	N/A	N/A	N/A

Note: 1) The response rates for Wave 3 have not been released. 2) Both cross-sectional and longitudinal response rates are presented in the table as they have different meanings in terms of measuring the data quality. The cross-sectional response rate indicates the proportion of the respondents who responded in a certain wave conditional on the numbers of planned respondents, whilst the longitudinal response rate indicates the proportion of respondents who participated in a certain wave and all the previous waves as well (Cheshire *et al.,* 2011).
Source: (Zhao, 2015).

3.4 Selection of the study samples and potential bias issues

This section introduces the selection process for the analytical samples that address the RQs in this thesis and then discusses the potential bias issues of the study samples. For clear explanations of the constructions of the study samples, the research questions are presented here again:

RQ 1 What are the labour force participation patterns of older adults in China and how do these vary across different social groups?

RQ 2 What are the patterns of labour market exit of older adults in China and how do these vary across different social groups?

RQ 3 What are the work history patterns of older adults in China and how do these vary across different social groups?

RQ 4 What are the correlates of the labour force participation of older adults and how can they explain the heterogeneity in labour force participation between different social groups?

RQ 5 What are the predictors of the labour market exit in later life and how can they explain the heterogeneity in labour market exit between different social groups?

The first three RQs of this thesis are related to the patterns of the labour market behaviour of older adults and they are addressed by descriptive analysis focusing on the labour market behaviour of older adults at different time points. Specifically, cross-sectional Sample A is developed for the investigation of the labour market behaviour at one point in time (Chapter 4); longitudinal Sample B is developed for analysing the transition into economically inactive status over a four-year period, using multiple waves of the CHARLS (Chapter 5); lastly, the retrospective

data from the Life History Wave are utilised for the development of Sample C for the analysis of work trajectories (Chapter 6). The process of sample selection is shown in Figure 3.1.

The available data from the CHARLS include three prospective waves (Waves 1 to 3) and the Life History Wave. Concerning the construction of Sample A, Waves 1 and 2 were the two available choices when relevant data analysis was written up. The author used Wave 2 for the construction of Sample A since this later wave contains more valid cases and a checking procedure for most answers provided at the interviews in 2011. Wave 2 contains 18,264 cases who answered at least one module of the questionnaire. Respondents with missing age and respondents younger than age 45 in 2013 (born before 1st July 1968)[10] were removed as they are not the study focus of this thesis. Respondents with missing information on gender, *Hukou* status and marital status are removed as well, since these cases are very likely to contain missing information of other individual and family characteristics. The final sample size of Sample A is 17,316.

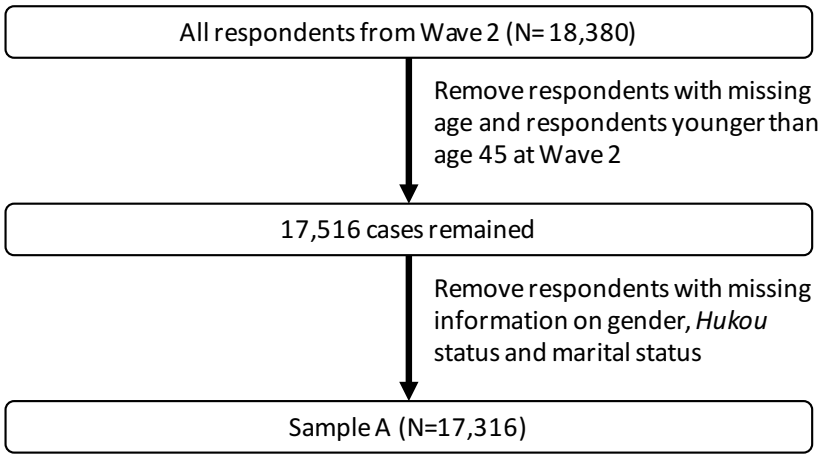
Concerning the investigation of the transitions into economically inactive status, there were three available longitudinal waves when the thesis was written up. This thesis analyses the four-year period between Waves 1 and 3 (i.e. between 2011 and 2015) rather than the two-year periods between waves to include as much as labour market exit as possible – as later empirical analysis shows that even the transition into economically inactive status over the four years is a rare event (see Section 5.2). The working status at Wave 2 is not included in the analysis since it may over-complicate the analysis, although a small group of respondents (around 5% in total) have experienced complex working patterns over the three waves such as being economically active at both Waves 1 and 3 but inactive at Wave 2. Yet, the working status at Wave 2 was also used for the construction of Sample B, since every wave after the baseline wave (Wave 1) provides a checking procedure for the information in the previous wave, and thus Wave 2 was used for the update of information in the baseline wave.

The three prospective waves of the CHARLS contain 17,708, 18,380 and 21,095 cases respectively. Respondents with missing information on basic demographics and respondents younger than age 45 at each wave were removed, which is similar to the operation for Sample A. The remaining cases are 16,755, 17,316 and 19,700 respectively. Next, these valid cases from three waves are merged into one dataset, where 13,352 cases remained. Another 385 cases were removed due to controversial information across waves. Lastly, another 3,655 respondents who were not working in 2011 were excluded as they are not the study focus of the transition into economically inactive between waves. The final sample size of Sample B is 9,312.

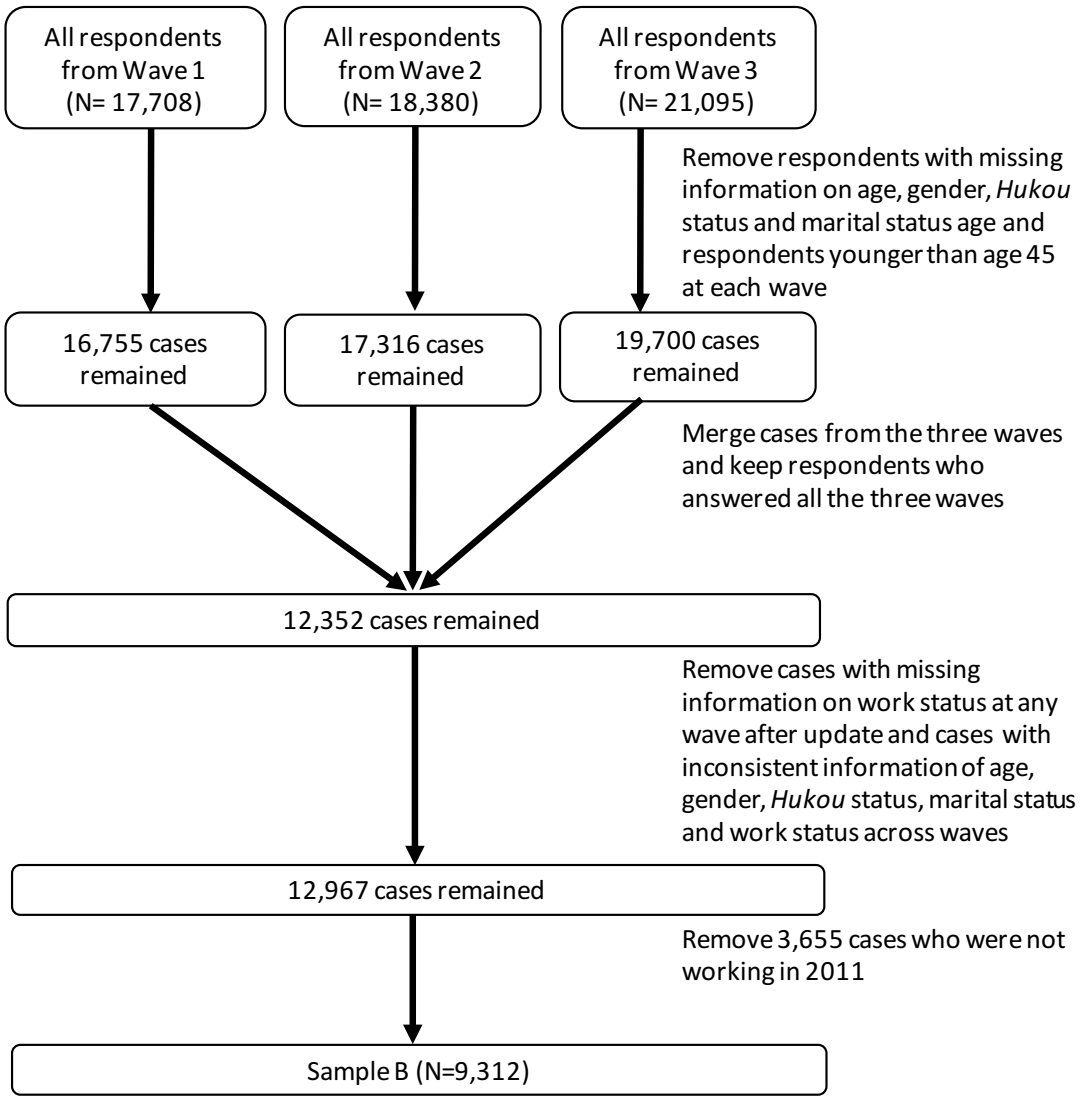
[10] Respondents younger than age 45 are the partners of interviewees aged 45 and over as interviewees.

Figure 3.1 Sample selection process

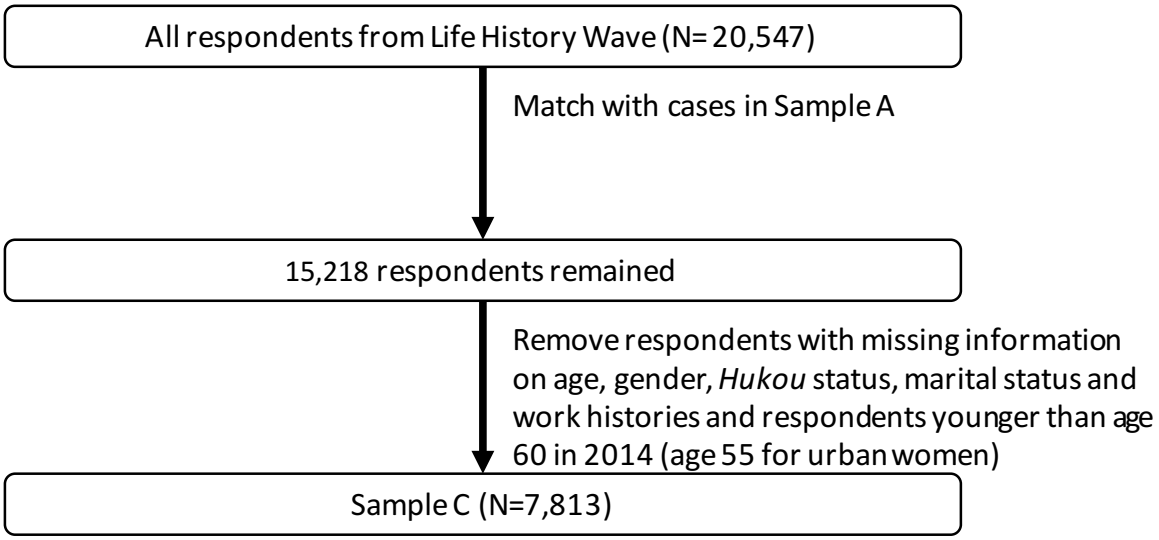
a) Sample A



b) Sample B



c) Sample C



Source: Author's own analysis using information from the CHARLS Waves 1 to 3 and the Life History Wave.

Sample C is developed for the investigation of the work histories of older adults, using the Life History Wave conducted in 2014. Sample C is selected from the 20,547 cases who answered the work history module in the Life History questionnaire. Amongst them, 15,218 cases participated in the interviews in 2013 as well and have matched information from that wave. Another 185 cases without valid work history information are removed afterwards. Lastly, only respondents aged 60 and over (55 and over for urban women) at the interview of Wave 2 (born before 1st July 1953, or before 1st July 1958 for urban women) are kept for the presentation of work history until the SPA and the final sample size of Sample C is 7,813.

Above are the construction of the three study samples of this thesis. The three samples are at first used for the descriptive analysis in Chapters 4 to 6. Samples A and B are used again for the multivariate analysis on the factors influencing the labour market behaviour in later life in Chapters 7 and 8. The valid cases used for models in Chapters 7 and 8 are different from the size of Samples A and B since cases with any missing values of explanatory variables cannot be included in the models (see Section 3.5.4).

The rest of this section discusses the potential bias by using study samples from the CHARLS. There can be selection bias from data sampling where the survey samples do not accurately represent the population. The biased sample statistics may systematically over- or under-estimate a population parameter. While random sampling techniques are commonly used in order to achieve non-biased samples, selection bias can still exist in most datasets due to non-responses, missing data and attrition (Groves, 2004).

A commonly used correction technique for the selection bias is weighting adjustment, especially for descriptive analysis (Groves, 2004; Bryman, 2015). The CHARLS provides the weights for the prospective waves (Waves 1 to 3). The weights are applied at the county level, the community (or village) level, the household level and the individual level respectively to adjust the potential selection bias due to the different population sizes of counties, communities (or villages) and households as well as non-response. However, the weights for the Life History Wave are not provided. It is not possible for the author to construct comparable weights across waves either, since the essential information (such as the name and the corresponding population of each county, community or village) is anonymous. The absence of weights for the Life History Wave means that using weights for the descriptive analysis in relation to Samples A and B but not Sample C can make the results from different chapters less comparable with each other. Thus, this thesis does not use weights to adjust the potential selection bias.

Instead, the author compares the weighted and un-weighted descriptive results of each prospective wave to investigate the potential selection bias of the analytical samples of this study and to what extent the potential selection may affect their representativeness of older adults in China. The distribution of basic demographics between the weighted and un-weighted samples are compared, including age, gender, *Hukou* status, educational attainment, marital status and access to the Occupational Pension Programme. The complete results are presented in Table A.7 and Table 3.3 presents the results of the Wave 2 as an example. According to Table 3.3, the differences between the weighted and un-weighted samples are not large. However, the youngest age group (age 45-49) and oldest age group (age 75 and over), urban residents, individuals with better socioeconomic status (reflected by education and access to pensions) and the widowed group are less representative in the sample. The urban-rural difference with and without weighting adjustment is the most significant (6.3%). Similar results are found within Waves 1 and 3 as well. Given this information, the heterogeneity in labour market behaviour between different social groups (such as between urban and rural residents, and between residents with different SES) in the total population can be larger than what is found in this thesis, since the individuals of specific groups are not included in the samples. This inference can be applied to the Life History Wave as well if we believe that situation concerning these waves conducted one or two years apart are relatively consistent. On the other hand, as this thesis conducted most descriptive analysis by subgroups, the characteristics of different groups are less likely to be affected by the selection bias.

Table 3.3 Distribution of the selected demographics of the samples from CHARLS Wave 2 (Percentage, Extracted from Table A.7)

	Without adjustment	With adjustment	Difference
Age group			
45-49	15.3	16.1	-0.9
50-54	17.0	16.8	0.2
55-59	18.5	18.3	0.2
60-64	18.5	17.2	1.3
65-69	12.3	11.5	0.8
70-74	8.4	8.3	0.1
75 and over	10.0	11.8	-1.7
Gender			
Male	48.6	48.7	-0.1
Female	51.4	51.3	0.1
Hukou status			
Non-agricultural	22.7	29.0	-6.3
Agricultural	77.3	71.0	6.3
Educational attainment			
Illiterate	25.9	24.0	1.9
Did not finish primary school	18.3	17.1	1.2
Primary school	21.3	21.1	0.2
Middle school	21.2	21.6	-0.4
High school and above	13.2	16.2	-3.0
Marital status			
Married	87.0	85.3	1.8
Divorced/Separated	1.2	1.5	-0.3
Widowed	11.0	12.4	-1.4
Never married	0.8	0.9	-0.1
Pension status of the OPP			
Recipient	15.3	19.3	-4.0
Contributor	6.1	7.0	-0.
Neither	78.6	73.7	4.9%

Source: Author's own analysis using information from the CHARLS Waves 1 to 3.

3.5 Data analysis strategy

This section introduces the data analysis strategy of this study, including univariate, bivariate and multivariate analysis. On the one hand, descriptive (univariate and bivariate) analysis was conducted to present the patterns of the labour market behaviour of older adults in Chapters 4 to 6. Specifically, sequence analysis was conducted to describe the work histories of older adults. On the other hand, multivariate analysis was applied to investigate the factors influencing the labour

market behaviour in later life in Chapters 7 and 8. All quantitative techniques were conducted using the STATA software.

3.5.1 Descriptive univariate analysis

With the use of basic statistics such as frequencies, percentage, average numbers, median numbers and hazard ratios, initial descriptive analysis provides an intuitive understanding of variables (Bryman, 2015). By showing the labour force participation in 2013 and the transition into economically inactive status in Chapters 4 and 5 respectively, the descriptive results in this thesis first provide a basic understanding of the patterns of the labour market behaviour of older adults. On the other hand, the distributions of key individual and family characteristics are presented, which present the heterogeneity in labour market behaviour prior to the further quantitative analysis of the factors that influence these patterns.

The majority of variables used for the descriptive analysis in this thesis are also used for the multivariate analysis in later chapters. The construction of all these variables are introduced in Section 3.6. Most of them are categorical and the number of missing values is small. Imputation is only applied to the variable 'household expenditure per capita' (see Section 3.6.1.3 for information on the construction of this variable and the potential bias in relation to the imputation).

3.5.2 Descriptive bivariate analysis: Cross-tabulations and Pearson's Chi-square tests

Bivariate analysis is a commonly used method to reflect the potential association between two variables (Bryman, 2015). Bivariate analysis can be conducted using cross-tabulations (also known as contingency tables), which show the distributions of categorical variables and facilitate the comparison between the proportions of different categories. Pearson's Chi-square tests are usually used together with cross-tabulations to examine the associations between categorical variables which are noted in cross-tabulations, as such a test does not rely on assumptions of normally distributed data (Diamond and Jefferies, 2001; Field, 2009). The associations detected by bivariate analysis are not necessarily causality and are usually further explored through multivariate analysis in most empirical studies.

The Chi-square test starts with a null hypothesis (H_0) that the two variables in cross-tabulations are independent (i.e. not associated with each other). The statistic formula is (Bryman, 2015):

$$\chi^2 = \Sigma \frac{(O - E)^2}{E}$$

Where, O = observed values and E = expected values. Expected values of each cell in cross-tabulations are calculated as (ibid):

$$Expected\ value = \frac{column\ total \times row\ total}{grand\ total}$$

Notably, the numerical values or counts used in the cells and the expected value in each cell should be five or greater. In order to determine whether the test is significant, the computed value χ^2 is compared with the critical value in the χ^2 distribution table based on the set level of significance and the number of degrees of freedom as below (ibid):

$$Degree\ of\ freedom = (number\ of\ rows - 1) \times (number\ of\ columns - 1)$$

The null hypothesis (H_0) is rejected if the test statistic is greater than the critical value, which means the categorical variables in the table are associated with each other. Otherwise, the variables are independent. The p-values can be used as an alternative indicator for the Chi-square test statistic. The p-value is the probability that, when the null hypothesis is true, the statistical summary would be greater than or equal to the actual observed results (ibid). Any smaller p-values indicate that the null hypothesis should be rejected and the two variables are associated.

In this thesis, bivariate analysis was performed to examine the association between the binary labour market outcomes and working, individual and family characteristics in Chapters 4 and 5. These descriptive results from bivariate analysis provide a basic understanding of whether the heterogeneity in labour market behaviour is related to these correlates, which contribute to the further multivariate analysis in Chapters 7 and 8. Specifically, whether the association is significant for each subgroup is examined separately, using 0.05 as the critical p-value for Chi-square tests. The number of observations for all age groups with each subgroup is reported in Figures 4.1 and 5.1. The numbers of observations for later figures are similar to these numbers and are not reported again, although they can be slightly different due to missing values. Besides that, certain variables are combined into fewer categories when conducting the bivariate analysis due to very small numbers of observations, which are discussed in details in later chapters.

3.5.3 Sequence analysis and cluster analysis

Sequence analysis was conducted to construct the work trajectories of older adults over the life course. Sequence analysis is a holistic approach that views and examines trajectories in the life course as whole units, which thus enables the attention to the order and timing of status within and between the full sequences (Abbott, 1995). With the support of the increasing availability of retrospective data and longitudinal data, a large body of recent research has applied sequence analysis to represent different types of life trajectories (Brückner and Mayer, 2005; Anyadike-

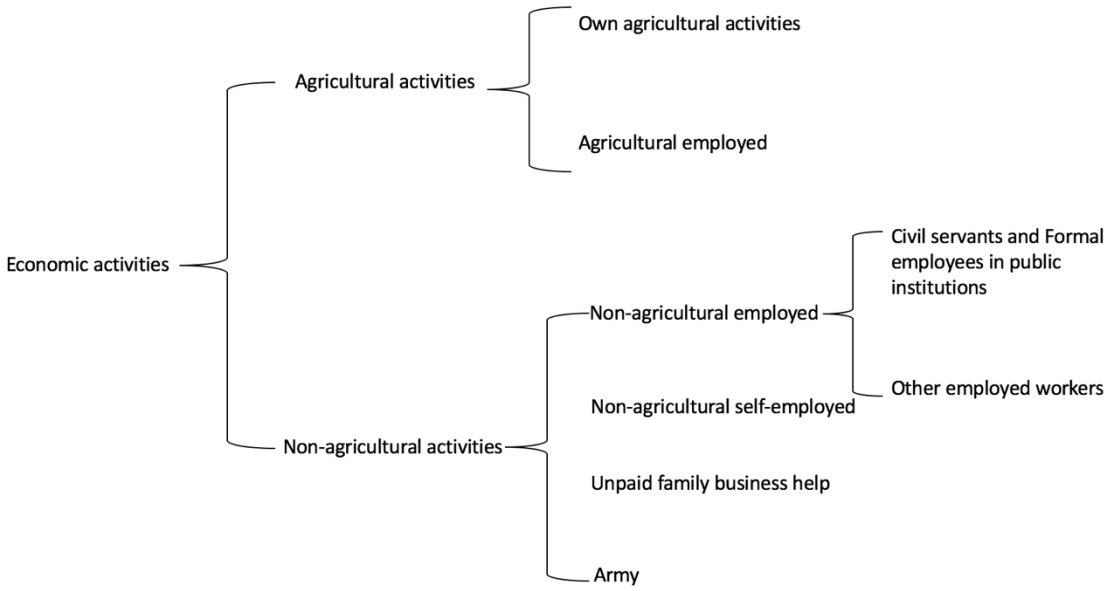
Danes and McVicar, 2010; Salmela-Aro *et al.*, 2011; Coulter and van Ham, 2013; Svensson *et al.*, 2015). As opposed to the traditional variable-based summaries of data, sequence analysis allow the patterns to emerge from data (Aisenbrey and Fasang, 2010), which is appropriate for this research since little analysis on the work histories of residents in China is available.

Data from the Life History Wave of the CHARLS were utilised for the construction of work histories in this thesis. The observation period is set as from ages 25 to 60 (55 for urban women) for the explorations on the work experiences in both prime working years and later life stages until the SPA. Using information on each paid work (including the start and end month and year of each job, the type of work unit and working hours), the author defined respondents' economic activity states and work intensity for each year during the working lives. Both characteristics of work have been used for the presentation of work histories in existing literature (Sefton *et al.*, 2011; Finch, 2014; Wahrendorf, 2015; Van der Horst *et al.*, 2017).

Based on the original classification of economic activities in the questionnaire (Figure 3.2), this thesis defined eight economic activity states. State 1 'Economically inactive' means that respondents were not engaged in any paid work. States 2 to 7 apply to years that are related to only one job. State 2 'Own agricultural activities' and State 3 'Agricultural employment' are related to agricultural work. State 2 includes activities such as farming, managing fruit trees, collecting agricultural and forest products, pisci-culture, fishing, raising stocks, selling own products in the market. State 3 includes work in collective farms (mostly before the 1980s) and farming for other landowners. States 4 to 7 are related to non-agricultural work: State 4 'Employment with *Bianzhi*', State 5 'Employment without *Bianzhi*' (or 'ordinary employment'), State 6 'Self-employment (including self-employment and unpaid family business help)' and State 7 'Military service'. State 4 and State 5 are distinguished from each other since employees with *Bianzhi* are privileged in terms of work positions, financial rewards and social welfare entitlements (see Section 3.2), and thus may have different work trajectories from those without *Bianzhi*. The last state is 'Multiple jobs at the same time', indicating respondents have held two or more jobs at the same time in a year.

The classification used in this thesis is the by far very specific one with the CHARLS datasets. The classification with the consideration of *Bianzhi* has also been used in relevant literature in the Chinese context (Ang, 2012). While the author has also considered other types of classification of economic states, such as the International Standard Classification of Occupations (International Labor Organization, 2018), there is not enough information from the CHARLS datasets for the application of these classifications.

Figure 3.2 Economic activity status of each job in the questionnaire



Source: Author's own analysis.

The corresponding work intensity at each age was constructed in a similar way. There are four possible states for work intensity: 'Economically inactive', 'Short episodes with unknown intensity', 'Long-term part-time work' and 'Long-term full-time work'. Information on working hours was used for the construction of work intensity. As the survey only collected information on working hours for jobs that lasted for at least 5 years, any work that is shorter than 5 years is classified as 'short episodes with unknown intensity'. For long-term work that lasts for at least 5 years, 30 hours per week is used as the threshold to distinguish between part-time and full-time work. If the respondents had multiple jobs at the same time for certain years, the highest working hours are used for the generation of the work intensity. The threshold of 30 hours for distinction between full-time work and part-time work has also been used in other published journal paper that applies to ELSA (e.g. Wahrendorf, 2015).

Next, this thesis presents index plots on the work histories of older adults. Index plots represent every sequence by a single line and thus allow for the most detailed longitudinal interpretation than other graphs.

For a more detailed presentation on the work histories, work trajectories are grouped into several typical trajectories using cluster analysis. The typology of work trajectories was developed based on economic activity states instead of work intensity, as results in this thesis show that work intensity is less heterogeneous and less likely to change (see Section 6.2). The clustering procedure is based on the dissimilarities ('distances') between sequences. There are different algorithms for calculating the dissimilarities. Optimal matching analysis is a traditional and the

most widely used methods for calculating the distances between sequences. Optimal matching analysis chooses the least 'costly' way of transforming one sequence into another combined with both substitution and Indel costs. The former measures the cost of substituting one state with another while the latter measures the cost of inserting or deleting a state in the sequences. When sequences are of equal length, only substitution costs need to be considered, as insertion or deletions can be set as a half max substitution cost (Halpin, 2014), as Indel costs will never be used by the algorithm in calculating the pairwise distances between the sequences if it is set as greater than half the largest substitution cost in this situation (p392, MacIndoe & Abbott 2004). In this thesis, the dissimilarities were calculated with Lesnard's dynamic hamming distances (Lesnard, 2010). Under this algorithm, state-to-state transition rates between sequences at each specific point of time were used to calculate the substitution costs (which means the substitution costs were different for each year) and no Indel costs were allowed. This method avoids the warping of time (temporal distortions) and enables more importance to the timing of events; existing studies have suggested that the Lesnard's dynamic hamming distances provided similar or even better typology than traditional Optimal matching analysis (Lesnard, 2010; Halpin, 2012; Wahrendorf, 2015).

Using the calculated dissimilarities, hierarchical clustering strategy and Ward's Linkages were used for cluster analysis. The decisions on the numbers of clusters are based on the performance of the Calinski-Harabasz Pseudo-F value (Je (2)/Je (1)) and the Duda-Hart Pseudo-T-squared statistical value (higher Je(2)/Je(1) and lower Pseudo-T-squared values indicate a better performance of certain cluster strategy).

The typology of work histories is used as an explanatory variable in the multivariate Logistic Regression and the construction of this variable is discussed in Section 3.54.

3.5.4 Multiple Logistic Regression Models and the outcome variables

Multivariate analysis was used to investigate the factors influencing the labour market behaviour in late life in Chapters 7 and 8. Specifically, the author investigates the correlates of being economically active in 2013 (Chapter 7) and the predictors of experiencing the transition into economically inactive status over the four-year period between 2011 and 2015 (Chapter 8).

As the research focus is the binary outcome of labour market behaviour, Logistic regression models suit such research purposes. Logistic regression models are used to estimate the probability (p) of a binary (dichotomous) event and are frequently employed in terms of the investigation of labour market behaviour (Pang *et al.*, 2004; Wakabayashi and Donato, 2006; Liao, 2012; Finch, 2014). Logistic regression models are denoted by the following formula:

$$\log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} \ldots + \beta_k X_{ki}$$

The expression on the left-hand side of the equation is a 'Link Function'. It is a transformation of the dependent variable that ensures the fitted value vary between 0 and 1. Here the Link Function is in the Logit form, which is the most commonly used. The expression on the right-hand side is the product of coefficients and explanatory variables (either continuous or categorical). The coefficients on the right-side can be obtained with maximum likelihood estimates.

The coefficients can be interpreted either on the odds scale or on the probability scale. The odds ratio (OR), which is the ratio of the probability of the two different outcomes, is another important definition in the model. According to the formula, a unit increase in X_i increases the log of the odds by β_i units. Thus, a unit increase in X_i multiplies the OR by e^{X_i} times In terms of OR, an OR larger than 1 indicates the probability of the outcome is higher for this group compared to the reference group and an OR smaller than 1 indicate the opposite situation. The p-value shows whether the association is significant. The most frequently used critical value of p-values is 0.05 (indicating a significance level of 0.05), and author uses 0.05, 0.01 and 0.001 as the critical values for different significance levels. The interpretation of probability of multiple Logistical regressions is more difficult because the values of all other variables need to be given.

In this thesis, two groups of models are developed using Logistic Models: Model A series and Model B series. Model A series (Models A1, A2 and A3) investigate the correlates of labour force participation in 2013. Model B series (Models B1, B2 and B3) analyse the factors influencing the transition into economically inactive status over the four-year period from 2011 to 2015.

- For Model A series: cross-sectional sample (Sample A) was analysed; 'whether economically active in 2013' is the outcome variable (1=economically active, 0=economically inactive) and personal characteristics reported in Wave 2 (2013) are explanatory variables.
- For Model B series: longitudinal sample (Sample B) was analysed; 'whether experiencing transitions over the four years' (1= experience labour market exit, 0= stay in the labour market) is the outcome variable; personal characteristics reported in Wave 1 (2011) and the changes in these characteristics between Wave 1 and 3 (2011 and 2015) are the explanatory variables.

Specifically, the Model B series make good use of the available longitudinal waves to explore the predictors that have an impact on labour market behaviours (rather than the reverse direction of causality) by focusing exclusively on those who were working in 2011 and using their characteristics in 2011 and the difference between 2011 and 2015 as explanatory variables at the

same time. The construction of Model B series improves the interpretation of the thesis since cross-sectional models do not solve the issue of endogeneity. Similar methods have been widely used in existing studies (Pavalko and Artis, 1997; Dahl *et al.*, 2000; Debrand and Sirven, 2009; King and Pickard, 2013). Model B distinguish between time-variant and time-invariant variables. For time-variant variables, the status in 2011 and the changes over the period are included in the model at the same time, which apply to health status, receipt of pension, marital status and the care provision to grandchildren and parents. This thesis did not use the Fixed-Effect or Random-Effect Models which are commonly used for longitudinal data, since the available waves are limited (three waves) and the observation period is relatively short. However, the Model B series are a a simplification of Fixed effect that make use of longitudinal data to control unobserved within-individual characteristics using different scores within two periods (Allison, 2009).

Module F of the CHARLS questionnaire provides information for the construction of the two outcome variables of this thesis. Module F consists of fourteen parts: the first part of Module F asks about whether respondents were economically inactive at each interview; the other thirteen parts ask details of the current work (if any) and other work-relevant status. Module F starts by asking all respondents the question that 'Did you engage in agricultural work for more than 10 days in the past year?'. If the answer is 'yes', the other questions in the first part will be skipped and respondents will be asked about questions from later parts of Module F concerning the details of their current agricultural work and whether they have any non-agricultural work. If the answer is 'no', the following question 'Did you work for at least one hour for the last week (related to employed, self-employed and unpaid family business work)?' will be asked. Similarly, if the answer is 'yes', the next several questions are skipped, and these respondents will be asked about details about their current non-agricultural work. If the answer is 'no', the third question 'Did you have a job but are temporarily on leave, or in training, and you sure you can be back at a definite time or within 6 months?' will be asked. The answer of 'yes' means the respondent had non-agricultural at the interview but was not working last week. Thus, questions on the details of the current non-agricultural work will the asked. If the answers for all the three questions above are 'no', the respondent is regarded as economically inactive at the interview and will not be asked about details about the current work.

The two outcome variables for Models A and B series can be constructed based on these answers. In terms of the outcome variable of Model A series, respondents who answered 'no' for all the three questions above are defined as economically inactive, otherwise economically active. In terms of the outcome variable of Model B series, respondents who were economically active in 2011 but became economically inactive in 2015 are defined as experiencing the transition into

economically inactive status (i.e. labour market exit), otherwise regarded as staying in the labour market. The distribution of the outcome variables is shown below.

Table 3.4 Labour force participation at 2013 (Sample A, N=17,316)

Work status	Number of respondents
Total	17,316
-- Economically inactive in 2013	5,647*
-- Economically active in 2013	11,575

Note: There are 58 out of 5,647 respondents who were looking for work recently at the time of interview.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Table 3.5 The transition into economically inactive status between 2011 and 2015 (Sample B, N=9,312)

Work status	Number of respondents
Respondents worked in 2011 (Total)	9,312
-- Respondents who stayed in the labour market over the four years	7,445
-- Respondents who experienced labour market exit over the four years	1,867

Source： Author's own analysis using data from the CHARLS Waves 1 to 3.

The inclusion of explanatory variables in Models A and B series follows the conceptual framework developed in Section 2.5. For both models, the strategy for the adding variables is the "Enter" strategy, that is, the explanatory variables at the three different levels are added into the models sequentially. Models A1 and B1 include individual characteristics as explanatory variables. Models A2 and B2 include both individual and family characteristics as explanatory variables; in other words, indicators of family characteristics are added into Models A1 and B1, with all variables in Models A1 and B1 kept as control variables. The final Models A3 and B3 include individual characteristics, family characteristics and work trajectories as the explanatory variables; the typology of work histories is the main focus whereas the individual and family characteristics are control variables[11]. The lowest age threshold is limited to age 60 (55 for urban women) in Models

[11] Ideally, the significance of all individuals and family characteristics after the inclusion of the variable of the typology of work histories should be discussed. However, as the age threshold for the samples in Models A3 and B3 also changed, such a discussion will not be meaningful – the focus of this thesis is not the changes due to the smaller sample size or the differences between the older population and respondents older than 60. Thus, the inclusion of the typology of work histories in Models A3 and B3 are actually based on the significant variables in Models A2 and B2 only.

A3 and B3, making the sample size of Models A3 and B3 smaller. Tables 3.5 and 3.6 reports all the explanatory variables at each level. The details on the constructions of explanatory variable are discussed in Section 3.5. Both model series report Pseudo R-square results for the comparison between the changes in the power of explanation after adding new variables.

The ORs and p-values for each variable are reported for model interpretation. Similar to the discussions in Section 3.5.2, the p-values indicate whether the associations shown by the ORs are significant. The ORs can be any values large than 0; an OR between 0 and 1 indicate that the probability of that variable (category) is smaller than the reference group; an OR larger than 1 indicate that the probability of that variable (category) is larger than the reference group. For instance, the OR of urban men aged 50-54 is 0.47 ($p<0.05$), which can be interpreted as the odds of labour force participation for this age group is 0.47 times that of urban men from the 45-49 age group, *ceteris paribus*. In other words, the probability of working in 2013 for urban men aged 50-54 is lower than that of urban men aged 45-49, holding all other variables constant.

Table 3.6 Modelling strategy of Model A series (Based on Sample A, N=17,316)

Model	A1	A2	A3
Number of observations	N= 16,325	N=15,651	N=7,397
Minimum age	45	45	60 (55 for urban women)
Explanatory variable at the individual level	Age group	Age group	Age group
	Have any ADL difficulties*	Have any ADL difficulties*	Have any ADL difficulties*
	Have any IADL difficulties*	Have any IADL difficulties*	Have any IADL difficulties*
	Have any Chronic illnesses	Have any Chronic illnesses	Have any Chronic illnesses
	Educational attainment	Educational attainment	Educational attainment
	House ownership	House ownership	House ownership
	Quntiles of household expenditure per capita	Quntiles of household expenditure per capita	Quntiles of household expenditure per capita
	Receive benefits from the Occupational Pension	Receive benefits from the Occupational Pension	Receive benefits from the Occupational Pension
	Receive benefits from the Residents' Social Pension Programme	Receive benefits from the Residents' Social Pension Programme	Receive benefits from the Residents' Social Pension Programme
Explanatory variable at the family level		Marital status and whether spouses are working	Marital status and whether spouses are working
		Material transfer with family members	Material transfer with family members
		Any granchidlren under 16s*	Any granchidlren under 16s*
		Care provision to grandchildren	Care provision to grandchildren
		Any surviving parents*	Any surviving parents*
		Care provision to parents	Care provision to parents
Explanatory variable of work histories			Typology of work trajectoires

Note: 1) In the actual models, the prevalence of ADL difficulties, the number of surviving children, whether having any grandchildren under 16s and whether having any surviving parents were removed. All of the above operations are due to multicollinearity issues (see Section 3.6.4). 2) The divorced, separated and never married groups were removed from Models A2 and A3 due to the small sample size.
Source: Author's own analysis.

Table 3.7 Modelling strategy of Model B (Based on Sample B, N=9,312)

Model	B1	B2	B3
Number of observations	N= 9,252	N=8,747	N=3,772
Minimum age	45	45	60 (55 for urban women)
Explanatory variable at the individual level	Age group	Age group	Age group
	Have any ADL difficulties*	Have any ADL difficulties*	Have any ADL difficulties*
	Changes in any ADL difficulties*	Changes in any ADL difficulties*	Changes in any ADL difficulties*
	Have any IADL difficulties*	Have any IADL difficulties*	Have any IADL difficulties*
	Changes in any IADL difficulties*	Changes in any IADL difficulties*	Changes in any IADL difficulties*
	Have any Chronic illnesses	Have any Chronic illnesses	Have any Chronic illnesses
	Changes in any chronic illnesses	Changes in any chronic illnesses	Changes in any chronic illnesses
	Educational attainment	Educational attainment	Educational attainment
	House ownership	House ownership	House ownership
	Quntiles of household expenditure per capita	Quntiles of household expenditure per capita	Quntiles of household expenditure per capita
	Receive benefits from the Occupational Pension	Receive benefits from the Occupational Pension	Receive benefits from the Occupational Pension
	Occupational Pension Programme	Occupational Pension Programme	Occupational Pension Programme
	Receive benefits from the Residents' Social Pension Programme	Receive benefits from the Residents' Social Pension Programme	Receive benefits from the Residents' Social Pension Programme
	Change in the receipt of the Residents' Social Pension Programme	Change in the receipt of the Residents' Social Pension Programme	Change in the receipt of the Residents' Social Pension Programme
Explanatory variable at the family level		Marital status and whether spouses are working	Marital status and whether spouses are working
		Changes in marital status	Changes in marital status
		Material transfer with family members	Material transfer with family members
		Any granchidlren under 16s*	Any granchidlren under 16s*
		Care provision to grandchildren	Care provision to grandchildren
		Changes in care provision to grandchilren	Changes in care provision to grandchilren
		Any surviving parents	Any surviving parents
		Changes in any surviving parents	Changes in any surviving parents
Explanatory variable of work histories			Typology of work trajectoires

Note: 1) In the actual models, the prevalence of ADL difficulties, the number of surviving children and whether having any grandchildren under 16s were removed. All of the above operations are due to multicollinearity issues (see Section 3.6.4). 2) The divorced, separated and never married groups were removed from Models A2 and A3 due to the small sample size.
Source: Author's own analysis.

3.6 Explanatory variables for Multiple Logistic models

Section 3.4.4 has introduced the operation of Multiple Logistic Models in this thesis and the outcome variables. This section introduces the construction of explanatory variables used in the models. For each explanatory variable, the initial frequencies and the number of missing cases are reported (based on Sample A). Cases with missing values are kept in the study samples for descriptive analysis but are removed from models automatically. See Tables A.3, A.4 and A.5 for the full results of the profile of Samples A, B and C with information on all explanatory variables and the valid number of observations.

3.6.1 Individual characteristics

3.6.1.1 Ascribed factors: Age, gender and Hukou status

Logistic models in the thesis are presented separately for the four subgroups (urban men, urban women, rural men and rural women) since the most significant heterogeneity in labour market behaviour is likely to exist between living areas and gender. The classification of the four subgroups is based on the indicators of *Hukou* status and gender.

Respondents' *Hukou* status is in accordance with the original variable of *Hukou* status in each wave. Respondents have either agricultural *Hukou* or non-agricultural *Hukou*. There can be changes in *Hukou* status between waves (usually from agricultural to non-agricultural due to migration and also the reclassification of rural areas as urban). For cross-sectional Sample A, *Hukou* status in 2013 (Wave 2) is used; For Sample B, *Hukou* status in 2011 is used, which is the beginning of the four-year observation period. This paper refers to residents with agricultural *Hukou* as rural residents and those with non-agricultural *Hukou* as urban residents. Following this definition, some migrant workers may have long-term stay in urban areas in a year but they are still classified as rural residents.

On the other hand, the indicator of gender remains the same as the original binary variable of gender in the dataset. With the combination of the indicators of *Hukou* status and gender, the four subgroups can be distinguished from each other. For Sample A, the numbers of observation for urban men, urban women, rural men and rural women are 2,071, 1,859, 6,343 and 7,043 respectively.

Age is one of the most important indicators of labour market behaviour: existing literature has shown an age effect where increasing ages are related to a lower probability of labour force participation; specifically, age is related to the eligibility of claiming pension benefits, which makes an impact of individuals' labour market behaviour due to financial resources (see Section 2.3.1.1). This thesis uses **Age Group** as the indicator to measure the age effect on labour market behaviour in Models A and B series. The age (on 1st July at each year) is calculated with the information of year and month of birth from the CHARLS. The **Age Group** variable includes six categories: 1) 45-49, 2) 50-54, 3) 55-59, 4) 60-64, 5) 65-69 and 6) 70 and over. There are no missing values on age, gender, and *Hukou* status as cases with missing values have been removed when constructing Samples A and B (see Section 3.4).

Additionally, the indicator of **Region** is used as a control variable. Apart from the use of *Hukou* status, the indicator of individuals' residence of regions (eastern, central and western regions) is also frequently employed by multivariate analysis in existing studies, as there are huge

geographical differences between regions and provinces in China in terms of the economic growth and the labour market, which are likely to shape the labour market behaviour of residents (Cai *et al.*, 2002). The region information is obtained from the information of province and community in the CHARLS. There is no missing cases on this variable.

3.6.1.2 Health status

Poor health status has been shown to be related to a lower probability of working in both international and Chinese literature (see Section 2.3.2). This thesis analyses the impact of health status on labour market behaviour from two aspects. The first aspect is the prevalence of ADL and IADL difficulties, which is intensively studied in existing literature (e.g. Dwyer and Mitchell, 1999). The second aspect is the prevalence of chronic illnesses, which is investigated in a much limited number of studies, such as the work of Wilson (2001), Miah and Wilcox-Gok (2007) and Li *et al.* (2014).

Within the topic of labour market behaviour, health status is commonly measured by overall self-reported health levels (Flippen and Tienda, 2000; McGarry, 2004). In most cases, respondents choose one option that fits their self-evaluation on their overall health status from five options on a Likert Scale ranging from excellent to very poor to choose (Idler and Benyamini, 1997). It has been argued in the pioneering work of Bound *et al.* (1999) that the simple application of self-reported health conditions may fail to reflect the full scale of the influence of health on labour force participation. Firstly, people have psychological and economic incentives to alter their response to self-rated health conditions (Campolieti, 2002). Individuals may use health as a justification for staying in or out of the labour market, and exaggerate (or downplay) their health problems according to their different attitudes towards labour force participation (McGarry, 2004). On the other hand, people may have economic incentives to report worse-than-actual health conditions, such as claiming for disability retirement benefits. Secondly, self-reported health conditions may not be comparable across respondents due to the lack of comparable standard amongst individuals, which may cause measurement bias (Bound et al., 1999).

Compared to subjective evaluation of health status, objective measurements of health status are more impersonal and reliable. There are a wide range of objective health measurements, including the existence of any ADL or IADL difficulties, BMI (Body Mass Index) and grip strength. More details on the morbidity of specific physical or mental illness as objective indicators are also included in recent research as well (Dwyer and Mitchell, 1999; Wilson, 2001; McGarry, 2004; Han Au et al., 2005; Miah and Wilcox-Gok, 2007). Nevertheless, there is a critique that these measurements are not necessarily correlated with the aspects of health that affect individuals' capacity to work and the application of them can produce measurement bias (Roberts, Rice and

Jones, 2010). In fact, as Campolieti (2002) and Kalwij & Vermeulen (2007) argue, researchers usually face a trade-off in the application of either indicator as both have problems that can lead to biased estimations.

In this thesis, three binary (dummy) variables are used to measure health status: **the prevalence of ADL difficulties, the prevalence of IADL difficulties and the prevalence of chronic illnesses.** The module of health status in the CHARLS questionnaire starts with self-reported health, chronic illness and mobility problems; if all of these are good, the ADL/IADL evaluation will be skipped (they will be coded as no difficulty). For those answered the ADL/IADL questions, there are a series of specific questions for ADL and IADLs, including dressing, bathing or showering, eating, getting into or out of bed, using the toilet, doing household chores, preparing meals, shopping, making phone calls and taking medication). There are four option for each question with increasing levels of difficulties: Can do; can do but having difficulties; need help; cannot do. The latter three categories are regarded as having difficulties in the thesis due to the consideration of the number of samples in each group. In terms of the indicator of chronic illnesses, a binary variable of whether having one of the eleven types of chronic illnesses in the questionnaire is generated.

Another three indicators of the changes in health status are constructed and used in Sample B. For the prevalence of ADL difficulties, the three categories are 'no change', 'deteriorated' and 'improved'. The categories for the prevalence of IADL difficulties are the same.

For the changes in chronic illnesses, a dummy variable of 'begin to have any chronic illnesses' are used. There is no category of improved health status as chronic illnesses are relatively stable and the long-term health conditions is not likely to reverse.

Missing values are very few: only 1 out of the 17,316 case in Sample A has missing information on health status.

3.6.1.3 Socioeconomic status

Existing studies have shown that financial resources are important to the decision of labour market behaviour since better financial status facilitate the decision of stopping work at earlier ages (see Section 2.3.3). Socioeconomic status is considered as a direct reflection of financial status, which can be measured with a group of metrics including educational attainment, occupation, income, wealth, and deprivation (Hurd *et al.*, 2004). Considering the availability of data, this study **uses educational attainment, household expenditure per capita and housing tenure** as indicators of SES. The construction of these variables are listed as below.

1) Educational attainment

There are 10 categories of educational attainment in the original questionnaire of the CHARLS. For descriptive analysis, educational levels were re-coded as six categorical variables by combining similar educational levels: 'Illiterate', 'Not finish primary school (equivalent to Sishu/home school)', 'Finish primary school', 'Finish Junior school', 'Finish senior high school (equivalent to vocational school)', 'Obtain college/university degree'. In the regression, the last two categories are combined because these groups are very small amongst rural residents. The use of categorical educational levels is common in literature, such as the work of Carmichael & Charles (2003) and Kotsadam (2011). The number of schooling years is not used as explanatory variables since the schooling years for compulsory and higher education vary across different provinces of China and longer schooling years do not necessarily represent higher educational levels.

The missing values of educational attainment are few: 16 cases in Sample A did not provide valid information on education.

2) House ownership

The house ownership can be a reflection of residents' major wealth in the Chinese contexts since other financial assets (deposit, bond stocks, funds) (values of real estate, business assets, savings and checking accounts) and the income from them are uncommon (Giles *et al*., 2011).

The questionnaire asked whether the current living place is owned by household members; if the answer is yes, there are further questions asking whether the respondent (and his/her spouses) are the owner of this property and whether they have any other properties. The variable of house ownerships can be obtained these questions.

There are 707 out of 17,316 respondents in Sample A with missing information on this variable.

3) Quintiles of household expenditure per capita

The questionnaire asked detailed information on twenty-three types of living expenditure, which are classified into weekly payment (such as food, eating out expenditure, alcohol, cigarettes, cigars and tobacco expenditure), monthly payment (such as utilities and local transportation) and yearly payment (such as clothing, furniture and medical expenditure). The living expenditure on all of the twenty-three aspects is sum up for the calculation of the total household expenditure.

Due to the variation of household sizes, the total household expenditure is divided by the number of household members for the household expenditure per capita[12]. There are 2,630 cases had missing values on one or more items of expenditure. The average value of each category is used for imputation. The author considers the imputation as acceptable since there are many items and most respondents only miss one or two of them. In addition, to avoid the potential bias due to imputation, the quintiles of the household expenditure per capita (from the richest 20% to the poorest 20%) rather than the estimated values of expenditure are used in the models.

3.6.1.4 Pension entitlements and pension benefits

The pension is one of the most important income sources in later life. It is a reflection of financial status in later life and thus whether a person has the option to leave the labour market is closely related to this indicator (Section 2.4). This study investigates the impact of the Occupational Pension Programme (OPP) and the Residents' Social Pension Programme(RSPP).

For each programme, a categorical variable indicating **the receipt of pensions** is generated. Such an indicator is widely used in existing literature (Tang and Burr, 2015). The order of the relevant questions in the three waves is slightly different. The questionnaire of Wave 1 asked about whether the respondents are receiving pensions from the OPP (or the RSPP); for those with the answer of "no", there is a further question asked about whether they are contributors. The questionnaire of Waves 2 and 3 directly asked whether respondents are recipients or contributors to one of the programmes. The difference in order may cause inconsistency of the distribution of pension entitlements across different years (see Section 5.3.3).

3.6.2 Family characteristics

3.6.2.1 Marital status and Spouse characteristics

Existing literature has shown that marital status indicates a series of family characteristics and also the probability of joint retirement with spouses (e.g. Finch, 2014; see Section 2.4.1). In this study, individuals' marital status is classified into four categories: married (including cohabiting), divorced (including separated), widowed and never married.

[12] While the presence of younger children in larger households may affect the indicator of household expenditure, ignoring the age structure of households is acceptable for this study. The typical living arrangement of respondents is the single older adult household or the older couple household (40% in total). The majority of larger households contains only adults (33% in total). For households with younger grandchild(ren), their parents are also in the household and responsible for the living expense of their own children in most cases.

The working status of spouses is obtained by matching cases of couples and the answers of the other person within the couples. There are 1,050 respondents who are married but did not provide valid information on the working status on their spouses.

3.6.2.2 Material transfers with family members

1) **Number of children** and **Number of surviving parents**

Both variables show the basic family structure of respondents. There are loop questions in the CHARLS questionnaire, asking respondents to provide information on basic demographics of each child and whether there are any material transfers from (to) the child. Such information allows the calculation of the number of children. The number of surviving parents is obtained using a similar method.

2) **Material transfers with family members**

As discussed in 2.4.2, the material transfers from family members work as a supplementary income source for older adults and improve their financial conditions which may facilitate labour market exit in later life. A categorical variable of the material transfers (money or in-kind support) indicating the transfers from (to) the non-co-resident children last year can be constructed using the CHARLS data. This variable includes four categories: no material transfers; net recipients of material transfers; net providers of material transfers; material transfers in both directions. The variable of the material transfers with parents can be constructed in a similar way. However, due to the small proportion of material transfers with parents, the material transfers with children and parents are combined as one explanatory variables, namely the material transfers with family members.

3.6.2.3 Care provision to family members

1) Number of grandchildren and **Care provision to grandchildren**

The care provision to family members has been shown shown to decrease either the probability of labour force participation or the work intensity (see Section 2.4.3). The care provision to different family members is examined respectively in this study as the relationship between caregiver and recipients may influence the interaction between labour market exit and care provision (see Section 2.4.3). The CHARLS dataset facilitates the distinction between care recipients since caregiving to different family members were asked separated. The CHARLS questionnaire contains information on whether the respondents have looked after their parents (and parents-in-law) or grandchildren living inside or outside the household in the twelve months. Those answered ‘yes’ were then asked about the hours they have spent on the caring activities. Based on this information, the author calculated the number of grandchildren and the caring

hours for grandchildren each week. The care provision to children is rare and not considered in the thesis since the data shows that the youngest children on average are in their late 20s.

This study constructed categorical variables for the care provision to grandchildren: no care provision to grandchildren (or to parents); provide care provision to grandchildren (or to parents), with less than 10 caring hours per week; provide care provision to grandchildren (or to parents), with caring hours which are no less than 10 hours and no more than 20 hours per week; provide care provision to grandchildren (or to parents), with more than 20 caring hours per week.

2) Care provision to parents

The care provision to parents in 2011 and 2013 can be constructed similarly as the care provision to grandchildren. This thesis also analyses the changes in care provision over the four years. However, care provision to parents in 2015 is not available in the data. Whether there are any surviving parents in 2011 and the changes over the period are used as the alternative indicators.

The co-residence with grandchildren and parents is not included in the models as co-residence does not necessarily imply care provision in the Chinese context, and can result from preferences in living arrangements or from income or housing constraints (Maurer-Fazio *et al.,* 2011).

3.6.3 Work experiences

To investigate the impact of past work experiences on the labour market behaviour in later life, a categorical variables of the typology of work histories was constructed. The development of this variable followed the results of the sequence analysis and cluster analysis (see Sections 3.5.3 and 6.3). Such a variable has been used in many studies that examine the association between life trajectories and different outcomes in later life, such as the work of Wanderhorf (2015) and Stone *et al.* (2015). A summary of this variable for subgroup is shown in Table 3.8.

Table 3.8 Typology of work histories as the explanatory variable

Urban men	Urban women	Rural men	Rural women
Type 1 Limited economic activities	Type 1 Limited economic activities	Type 1 Long-term agricultural work	C1 Long-term agricultural work
Type 2 Long-term agricultural work	Type 2 Long-term agricultural work	Type 2 Long-term multiple jobs	C2 Agricultural work & inactivity
Type 3 Long-term multiple jobs	Type 3 Agricultural work & ordinary employment	Type 3 Agricultural work & Multiple jobs	C3 Inactivity & agricultural work
Type 4 Long-term self-employment	Type 4 Long-term self-employment	Type 4 Multiple jobs in middle years	C4 Long-term multiple jobs
Type 5 Long-term *Bianzhi* employment	Type 5 Long-term *Bianzhi* employment	Type 5 Long-term employment	C5 Limited economic activities
Type 6 *Bianzhi* employment with other early experiences	Type 6 *Bianzhi* employment with other early experiences	Type 6 Ordinary employment & agricultural work	C6 Long-term self-employment
Type 7 Long-term ordinary employment	Type 7 Long-term ordinary employment	Type 7 Long-term self-employment	C7 Long-term employment
Type 8 Ordinary employment with other early experiences	Type 8 Ordinary employment with other early experiences	Type 8 Agricultural work & inactivity	
Type 9 Mid-life career transformation	Type 9 Mid-life career transformation	Type 9 Limited economic activities	

Source: Author's own analysis.

3.6.4 Correlation matrices between explanatory variables

Correlation matrices were conducted to assess the strength of the relationship between the explanatory variables in this study. A multivariate regression model with highly correlated explanatory variables (multicollinearity) may fail to provide valid results in relation to explanatory variables (Farrar and Glauber, 1967) and removing the highly associated variables can avoid the potential issue (Midi, *et al.*, 2010).

Table A.7 in appendix reports the the correlation matrices for all explanatory variables for the four subgroups respectively. The aim here is to find strong-correlated factors and consider removing them to avoid the potential multicollinearity of the models. The correlation coefficients between each two variables lie between -1 and +1, with the value of -1 indicating a perfect negative relationship between two variables, and the value of +1 indicating a perfect positive correlation. A value close to zero indicates a lack of correlation; a value large than 0.5 indicate strong correlation (ibid). The p-values reflect the significance of such correlations.

According to Table A.7, most variables are significantly related to each other ($p<0.05$) but the correlations are very weak (coefficients are less than 0.1 in most cases). However, there are three aspects of strong correlations which may affect the model construction.

Firstly, there are strong associations between age and receiving benefits from the OPP and the RSPP. The first programme is found to be significant relationship amongst urban residents while the second is amongst rural residents. This means approaching the eligible age of the two programmes is strongly related to receiving pension benefits. The indicators of age and the receipt of pensions for meaningful model interpretations.

Secondly, age is significantly related to the number of surviving children and the number of surviving parents (larger than 0.5). The association between age and the number of grandchildren under 16s is moderate (around 0.3). The indicators of the number of surviving children and the number of surviving grandchildren are removed from the models due to their strong associations with age and also due to the fact that the variables of intergenerational material transfers and care provision are more specifically and directly related to the study focus.

Thirdly, the indicator of 'have any ADL difficulties' and 'have any IADL difficulty' are strongly correlated, so only the variable of 'have any IADL difficulty' is used in the final models reported in text (see Table A.10 for results on the indicator of ADL difficulties). On the other hand, neither of them are strongly correlated with the variable of 'have any chronic illness', so they can be used at the same time.

Lastly, in terms of SES indicators, educational attainment, expenditure per capita and housing characteristics are very slightly correlated; thus, the three variables can be added to the same model and the inclusion of them in the same model is unlikely to lead to multicollinearity or biased estimations.

3.7 Chapter summary

In order to achieve a comprehensive understanding of the labour market behaviour of older adults in China, quantitative methods and multiple longitudinal waves from the CHARLS have been employed for this thesis. The appropriateness of the methodology in relation to answering the RQs are discussed. The strength of the design, the details of study samples and the related potential bias have also been discussed.

Table 3.8 summarises the study design of this thesis, where the study samples and the data analysis strategy for each empirical chapter have been reviewed. For the next chapter, this thesis moves on the descriptive analysis of the patterns of labour market behaviour over the life course.

Table 3.9 Study design of the thesis

Research question	Chapter	Data Analysis Strategy	Study Sample	Sample Size
RQ1	Chapter 4	Univariate analysis and bivariate analysis	Sample A: Cross-sectional data; respondents aged 45 and over	17,316
RQ2	Chapter 5	Univariate analysis and bivariate analysis	Sample B: Longitudinal data; respondents aged 45 and over	9,312
RQ3	Chapter 6	Sequence analysis and cluster analysis	Sample C: Retrospective data; respondents aged 60 and over (55 for urban women)	7,813
RQ4	Chapter 7	Multiple Logistic Regression	Sample A*	Model A1 16,325 Model A2 15,651 Model A3 7,397
RQ5	Chapter 8	Multiple Logistic Regression	Sample B*	Model B1 9,252 Model B2 8,747 Model B3 3,772

Note: For Models A3 and B3, the samples are restricted to respondents aged 60 and over (55 and over for urban women), which lead to smaller sample sizes.
Source: Author's own analysis.

Chapter 4 Results I: Labour force participation of older adults in China

4.1 Overview

The following five chapters, Chapters 4 to 8, constitute the empirical results of the thesis. As discussed in Section 1.1, in order to achieve the research aim of a comprehensive understanding of the labour market behaviour of older adults in China, this thesis investigates a) the patterns of the labour market behaviour of older adults over the life course and b) the factors influencing the labour market behaviour in later life. Using descriptive analysis, Chapters 4 to 6 investigate the patterns of labour market behaviour of older adults, with a research focus on the heterogeneity that exists consistently over the life course and the changes in labour market behaviour across cohorts. Throughout the three chapters, the heterogeneity between urban and rural residents, and between men and women is anticipated to be the most prominent. Using multivariate analysis, Chapters 7 and 8 analyse the impact of factors on the labour market behaviour of older adults from different dimensions, including individual characteristics, family characteristics, work experience and the institutional background.

The results of the patterns of labour market behaviour (Chapters 4 to 6) and the factors influencing the labour market behaviour in later life (Chapters 7 and 8) are closely related to each other in terms of the thesis structure. On the one hand, the presentation of the variations in labour market behaviour between different social groups provides guidance on the investigation of the factors influencing the labour market behaviour in later life. On the other hand, the analysis of the these factors helps to explain the heterogeneity in labour market behaviour and indicates possible interventions to reduce the inequalities in the labour market.

The analysis of the patterns of the labour market behaviour over the life course in Chapters 4 to 6 provides some novel contributions to relevant literature in the Chinese context. On the one hand, this thesis depicts a comprehensive picture of the labour market behaviour of the old-age population. The application of the longitudinal and retrospective data adds depth to the current knowledge of labour market behaviour in the Chinese context by showing the work transitions over a period and the multiple jobs transitions over the life course. On the other hand, the dynamic changes in the work trajectories of different cohorts are presented, which provide evidence on the challenges concerning the labour market and the public pension system at present and in the future.

As the first empirical chapter on the patterns of labour market behaviour in this thesis, this chapter addresses RQ 1: *What are the labour force participation patterns of older adults in China and how do these vary across different social groups?* To address this research question, this chapter investigates the labour force participation of older adults at a single time point (year 2013), which offers a baseline for the subsequent analysis reported in later chapters. Sample A is used in this chapter, comprising 17,316 respondents who were aged 45 and over and answered the CHARLS Wave 2 (2013).

This chapter is arranged as follows: Section 4.2 presents the differences in labour force participation between urban and rural residents and between men and women; Sections 4.3 and 4.4 analyse the heterogeneity in labour force participation relating to individual and family characteristics; lastly, Section 4.5 outlines the main findings of this chapter and discusses the importance of this chapter in relation to the empirical results in the following chapters.

4.2 Urban-rural differences and gender differences in the labour force participation of older adults

Section 4.2 presents the descriptive results of the labour force participation of older adults aged 45 and over in 2013. The labour force participation rate[13] is the main research interest of this section; the corresponding work intensity and economic activities are analysed as well, providing additional information on the work status of respondents.

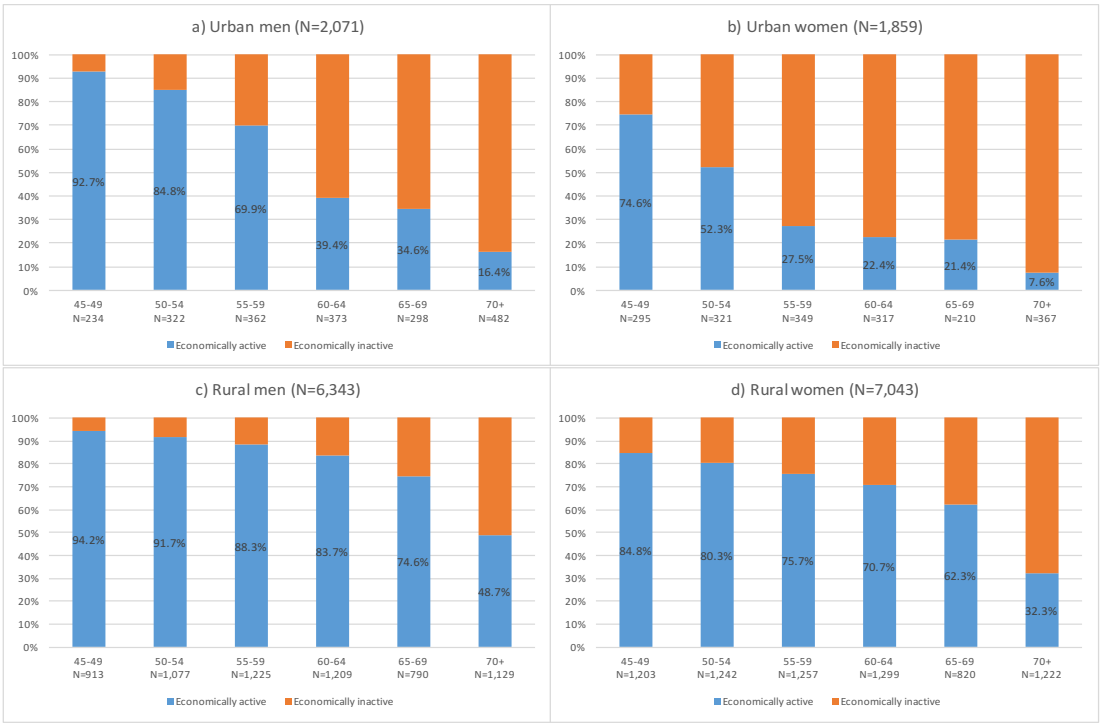
Figure 4.1 presents the labour force participation rates of the four subgroups (i.e. urban men, urban women, rural men and rural women). Multiple features regarding the differences in labour force participation between living areas and gender are worth noting. Firstly, it is universal within each subgroup that the older age groups have lower labour force participation rates than the younger ones, which is in accordance with our current knowledge on the association between age and labour force participation in different contexts, such as the work of Humphrey et al. (2003) and Giles et al. (2011). The labour force participation rates are at a very high level for the youngest age group (92.7%, 74.6%, 94.2% and 84.8%) but are much lower for the oldest age group (16.4%, 7.4%, 48.7% and 32.3%); the Chi-square tests show that the differences in terms of age groups are significant.

[13] The labour force participation in 2013 are calculated following the commonly used definition for labour force participation rate. According to OECD (2018), the labour force participation rate of an age group equals the labour force divided by the population of that age group. The labour force includes and working ones and people looking for work actively (usually the unemployed). This thesis did not distinguish the unemployed from the economically inactive group due to their small proportion (see Section 3.5.4).

Secondly, there are stark urban-rural differences in labour force participation. For urban residents, a substantial proportion of older urban residents who have approached the SPA of the Occupational Pension Programme (OPP) were economically inactive in 2013. The SPA for urban men is 60 – according to Figure 4.1, the labour force participation rate of the 60-64 age group is only 39.4%, which is 30.5% lower than that of the 55-59 age group. The case of urban women is similar – the 55-59 age group have a labour force participation rate of 27.5%, which is 24.8% lower than that of the 50-54 age group (the SPA for female staff is 50). In contrast, the differences in the labour force participation rates between different age groups are small amongst rural residents, except for the 70 and over age group. Besides that, there is no gap around the SPA of the Occupational Pension Programme (OPP) or the Residents' Social Pension Programme (RSPP) in terms of the labour force participation rates of rural residents. Such urban-rural differences indicate that there are strong incentives of leaving the labour market around the SPA of the OPP, which is further investigated in Section 4.3.3.

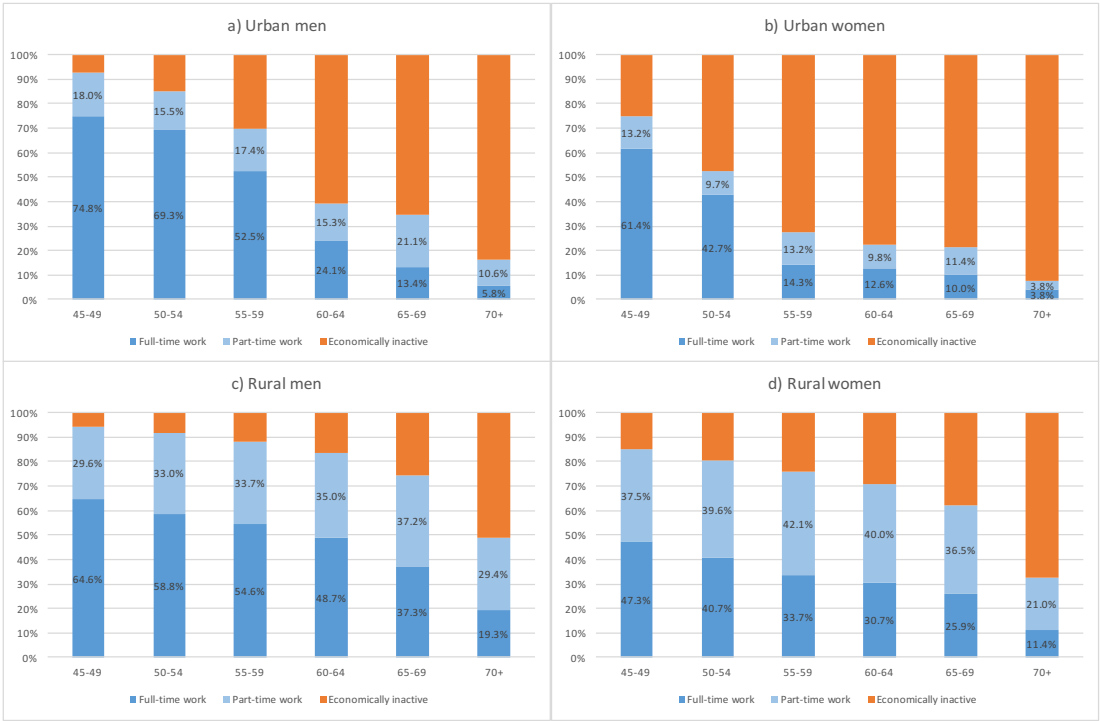
Thirdly, labour force participation is gendered amongst urban residents but not their rural counterparts. Urban women have lower labour force participation rates than urban men across all age groups. The most significant difference exists within the 55-59 and 60-64 age groups, where the labour force participation rates of urban women are 32.5% (84.8% minus 52.3%) and 42.4% (69.9% minus 27.5%) lower than urban men. The differentiation amongst urban resident indicates the impact of the gendered settings of the OPP, where the SPA for female employees is 5 to 10 years lower than men (see Section 1.4). Conversely, the difference in the labour force participation rates between rural men and rural women is much smaller, reflecting that they are less likely to engage in the OPP and be affected by the differentiated labour market policies between men and women.

Figure 4.1 Labour force participation in 2013 by gender, living area and age group (Sample A)



Note: The Chi-square tests are significant for all of the four subgroups at the 95% confidence level (p-value <0.05).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Figure 4.2 Work intensity in 2013 by gender, living area and age group (Sample A)



Note: The Chi-square tests are significant for all of the four subgroups at the 95% confidence level (p-value <0.05).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Figure 4.2 shows the breakdown of work intensity in 2013; several characteristics are of note. First, in terms of the urban-rural differences, the proportion of full-time workers amongst the economically active respondents is higher amongst urban residents than rural residents across all age groups. Taking the youngest age group as an example, the labour force participation rates of urban and rural residents are similar but the proportion of part-time workers amongst rural residents is higher (29.6% and 37.5% compared to 18.0% and 13.2%). The higher proportion of full-time workers amongst urban residents and their higher working hours is related to the full-time requirements of most work opportunities in the formal sector. In contrast, the higher proportion of part-time workers amongst rural residents is due to the seasonality of agricultural work which the majority of rural residents engage in.

Second, there are no significant gender differences in terms of work intensity. The ratios between full-time and part-time workers are similar across men and women, although rural women were slightly more likely to have part-time work than rural men (Figure 4.2). While existing literature reported that there was a higher proportion of part-time workers amongst women in many Western and Asian countries (e.g. Manning and Petrongolo, 2008), such a pattern is not found amongst the current older adults in China. This fact indicates the prevalence of the full-time dual-earner model within families in the Chinese context which was developed since the 1950s (see Section 1.5).

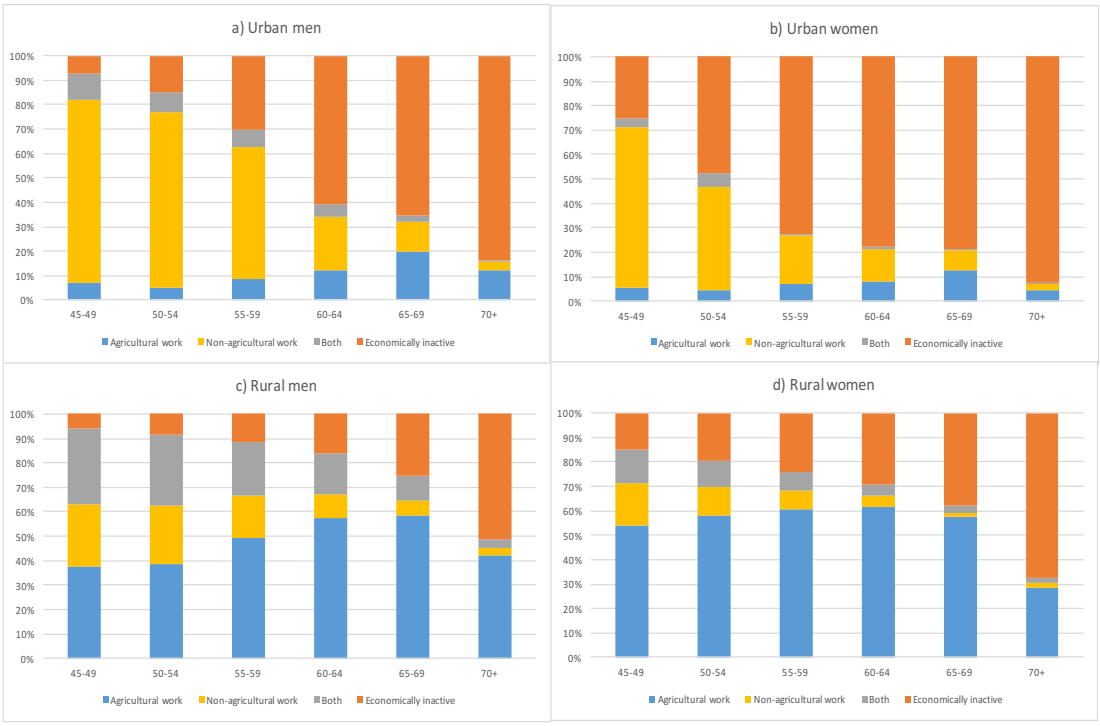
Third, in terms of the differences between age groups, the older age groups have a lower proportion of full-time workers than the younger age groups, whereas the proportion of part-time workers is stable across all age groups (Figure 4.2). Taking urban men as an example, the proportion of part-time workers is 18%, 15.5%, 17.4%, 15.3%, 21.1% and 10.6% respectively but the proportion of full-time workers ranges from 74.8% to 5.8%. The distribution of work intensity raises an interesting question about whether the transition into economically inactive status is relevant to the work intensity of the previous work, i.e. whether older adults experience reduced work intensity before they leave the labour market or they experience the transition into economic inactive status directly from their previous work without any changes in work intensity. This question is further addressed with the application of longitudinal data in Chapters 5 and 6.

Figure 4.3 presents the economic activities of the respondents who were working in 2013. Figure 4.3 mainly reflect the differences in terms of the dominant economic activities between urban and rural residents, which are related to the current structure of China's labour market. For urban residents, non-agricultural work is the dominant economic activity – non-agricultural work is largely related to the formal sector. A small group of urban residents were engaged in agricultural work in 2013 (around 10%); these urban residents are likely to reside in areas that have been

officially defined as urban areas but that feature mixed economic configurations of communities and villages. The group with both agricultural and non-agricultural work at the same time accounts for a small proportion as well. In addition, younger age groups are less likely to have agricultural work, which reflects their higher level of involvement in the formal sector.

On the other hand, agricultural work is the dominant economic activity of rural residents. Respondents with non-agricultural work account for about 15% of the group; these respondents are likely to have jobs in nearby counties (e.g. staff of rural authorities) or in urban areas (e.g. migrant workers). Respondents with agricultural and non-agricultural work at the same time account for a similar proportion; this group is related to migrant workers who work in both urban and rural areas around the year. Similar to the experience of urban residents, younger age groups are more likely to have non-agricultural work, which reflects their increasing involvement in the formal sector recently.

Figure 4.3 Economic activity status in 2013 by gender, living area and age group (Sample A)



Note: The Chi-square tests are significant for all of the four subgroups at the 95% confidence level (p-value <0.05); the 'both' category of urban men and women is not included in the Chi-square tests due to the small number of observation.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

4.3 Labour force participation and individual characteristics

Section 4.2 has provided an overview of the labour force participation of older adults in 2013 and the heterogeneity in their labour market behaviour between living areas and gender. Section 4.3

identifies the variations in labour force participation in terms of a series of individual characteristics, including health status, socioeconomic status and the receipt of pensions.

The three aspects of individual characteristics are discussed in Sections 4.3.1 to 4.3.3. Each section begins with a summary of existing literature on their associations with labour market outcomes in later life. Then, the distributions of these individual characteristics are presented (see Table A.3 for the full results of the profile of Sample A). Next, the associations between individual characteristics and the labour force participation rate in 2013 are tested using cross-tabulations and Chi-square tests.

4.3.1 Health status

Existing literature has shown that health status is an important factor that has an impact on labour market behaviour and that the deterioration in health can result in limitations, adjustments or cessations of work (e.g. Cai and Kalb, 2006; Zhang, 2011, see Section 2.4.2). The prevalence of any IADL (or ADL) difficulties and chronic illnesses are used as the proxy of health status in this thesis (see Section 3.6.1 for rationale).

The proportion of respondents with any ADL or IADL difficulties are similar. The proportions of respondents reporting any ADL difficulties in 2013 for the four subgroups are 12.5%, 15.3%, 15.6% and 20.1% respectively; the proportions of respondents reporting any IADL difficulties in 2013 are 12.6%, 15.6%, 26.4% and 24.8% (see Table A.3). Given the similar distribution of the two indicators and their strong correlation with each other (see in Section 3.6.4), the prevalence of ADL difficulties and the IADL difficulties can reflect similar associations between labour force participation and health status. Thus, this thesis only uses the prevalence of IADL difficulties and reports the results in relation to IADL difficulties[14].

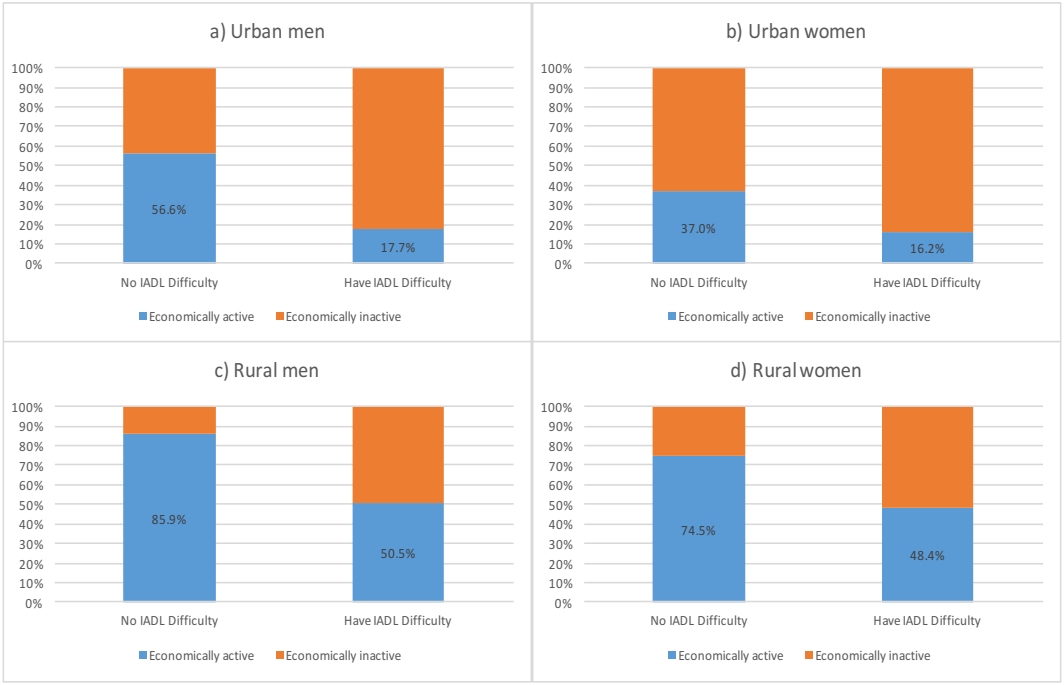
On the other hand, there is a high prevalence rate of chronic illnesses in both living areas. About 70% of respondents reported having at least one type of chronic illness in 2013, and the self-reported diagnosis rate is slightly lower in rural areas (see Table A.3). According to these results, a high proportion of older adults have certain health conditions, which may affect the ability of working and their wellbeing.

In terms of the association between health status and labour force participation, there are significant differences in the labour force participation rates between individuals with different

[14] See Figure B.1 in Appendices B for the association between labour force participation and ADL difficulties.

health status. Figure 4.4 shows that the groups with any IADL difficulties have much lower labour force participation rates. Taking urban men as an example, 56% of respondents without any IADL difficulties were working in 2013 but only 11.6% of respondents with IADL difficulties were working. On the other hand, a similar negative association between the prevalence of chronic illnesses and labour force participation is found, although the differences in the labour force participation rates between respondents with and without chronic illness are subtler compared to the case of IADL difficulties (see Figure B.2). This is possibly due to the fact that all chronic illnesses have been combined into one indicator. The levels of the impact of different types of chronic illnesses can be different, since some less serious chronic illnesses may not stop people from working directly.

Figure 4.4 Labour force participation in 2013 by whether having IADL difficulties (Sample A)



Note: The Chi-square tests are significant for all of the four subgroups at the 95% confidence level (p-value <0.05).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

4.3.2 Socioeconomic status

Regarding individual characteristics, the impact of socioeconomic status (SES) is another study focus of existing literature, where large differences in labour market behaviour between groups with different SES have been reported (e.g. Radl, 2013, see Section 2.4.3). The main explanation on the impact of SES within literature is that SES is an indicator of available financial resources in later life and is related to the probability that older adults can support themselves financially if leaving the labour market. This section uses three indicators to measure SES, including

educational attainment, house ownership and household expenditure per capita (see Section 3.6.1 for rationale).

The distribution of the three SES indicators reflects consistent urban-rural differences. First, in terms of educational attainment, urban residents have far better educational levels than rural residents. Most urban residents have moderate educational levels and more than 80% of urban men and 70% of urban women have finished junior school (see Table A.3). The educational attainment of the rural residents is much lower, especially rural women; about 45% of rural women are illiterate and very few rural women have experienced tertiary education (see Table A.3). In this sense, while the development of China's labour market since the 1980s has offered more working opportunities in the formal sector to rural residents, rural women's disadvantages in terms of educational attainment are very likely to restrict them to agricultural work and this results in their lack of access to pension entitlements. Second, in terms of the annual household expenditure per capita, the median value is around 7,500 CNY for urban residents but only 4,700 CNY for rural residents. Lastly, in terms of the housing tenure, house ownerships are prevalent in both living areas (higher than 80%, see Table A.3), but there are significant differences in the value of properties. The median house value is up to 160,000 CNY and 200,000 CNY for urban men and urban women but is only about 60,000 for rural residents.

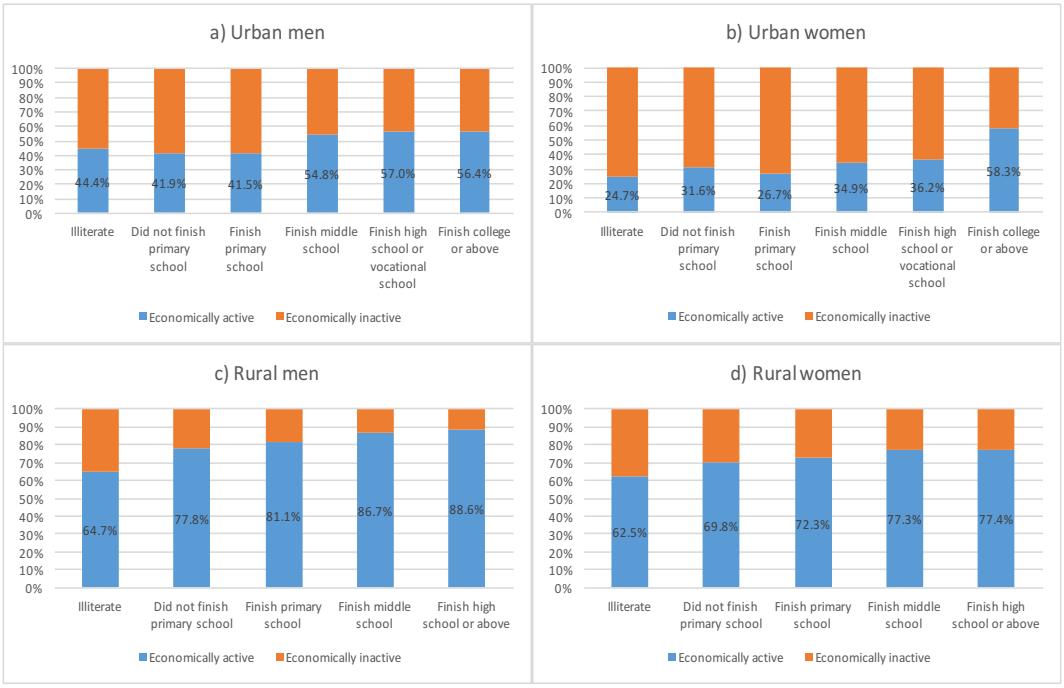
The three SES indicators do not reflect a strong and consistent association between SES and labour force participation. Firstly, higher educational attainment is related to a higher probability of labour force participation amongst all respondents (Figure 4.5). The association shows the complex meaning that educational attainment may have. Higher educational attainment may indicate not only higher economic rewards from work and abundant financial resources (both of which can contribute to a lower probability of labour force participation), but also individuals' higher human capital investments on themselves, which can make an impact on the possibility of finding certain jobs or the willingness to stay in the labour market. For example, urban women with university or college degrees are more likely to be qualified for *Bianzhi* employment, which is related to a five years' higher SPA than work positions without *Bianzhi*. The impact of education from these two aspects can be offset by each other, which may explain the relationships between education and labour force participation across the four subgroups.

Secondly, respondents without house ownerships have lower labour force participation rates across all of the four subgroups (Figure 4.6). Their lower labour force participation rates may relate to a third factor, such as the difficulty of finding jobs due to lower educational attainment.

Thirdly, the differences in labour force participation rates between groups with different household expenditure are small (Figure 4.7). The small variations in labour force participation

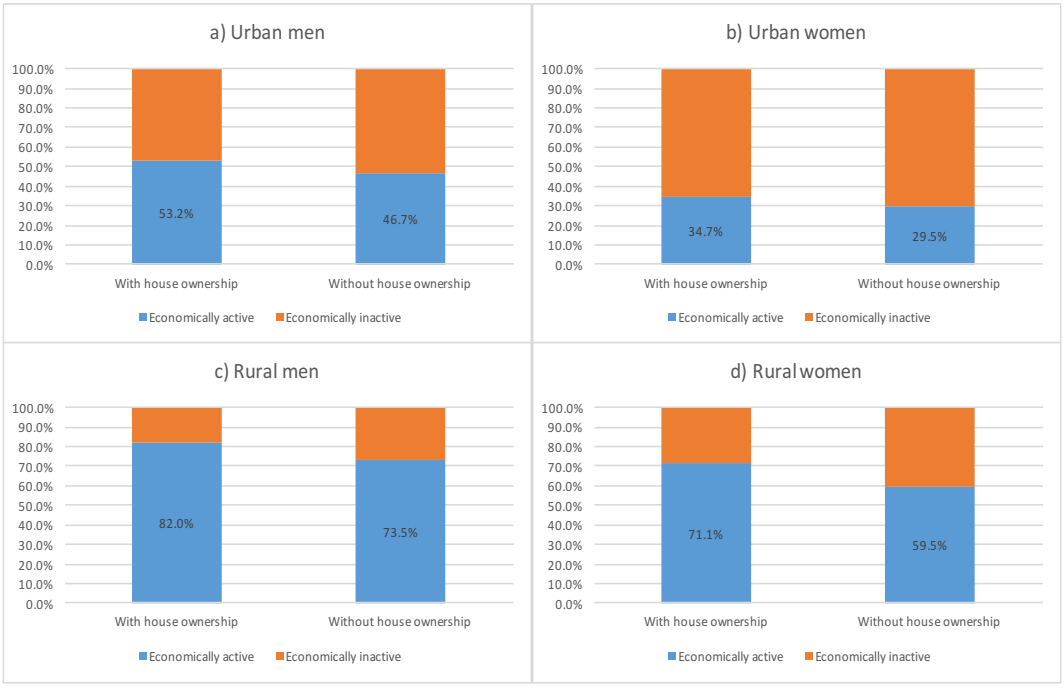
between groups with different household expenditure are possibly due to the usage of quintiles, which are not distinctive enough to indicate any significant differences in labour force participation between groups. Given the results of the three indicators, the association between SES and labour force participation needs to be further tested using multivariate analysis.

Figure 4.5 Labour force participation in 2013 by educational attainment (Sample A)



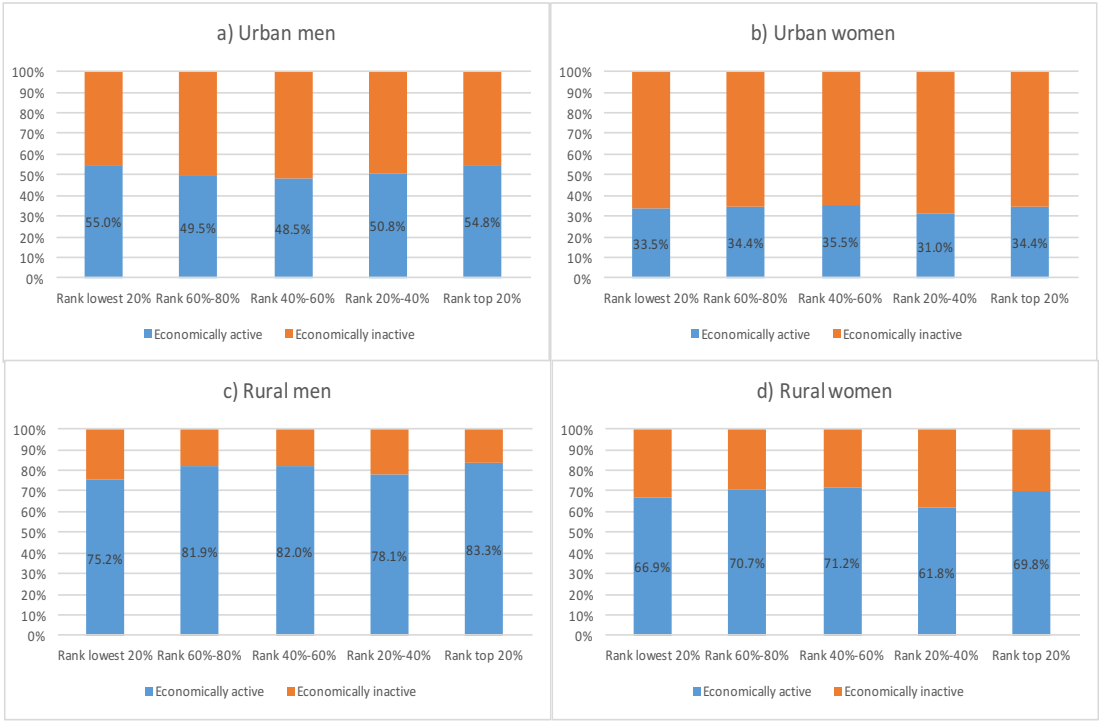
Note: 1) For rural men and rural women, the last two categories of educational attainment ('Finish high school' and 'Finish college or above') are combined due to the small sizes of these two groups. 2) The Chi-square tests are significant for all of the four subgroups at the 95% confidence level (p-value <0.05).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Figure 4.6 Labour force participation in 2013 by house ownership (Sample A)



Note: The Chi-square tests are significant for all of the four subgroups at the 95% confidence level (p-value <0.05).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Figure 4.7 Labour force participation in 2013 by household expenditure per capita (Sample A)



Note: The Chi-square tests are significant for rural residents at the 95% confidence level (p-value <0.05).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

4.3.3 Pension entitlements and pension benefits

Existing literature has shown that pension benefits are an important income source for older adults and work as an important economic incentive for their labour market exit (e.g. Berkel and Börsch-Supan, 2004, see Section 2.3.4). This section investigates the coverage and benefit levels of the two major pension programmes in China (i.e. the OPP and the RSPP), and their association with labour force participation in later life. The two programmes are examined separately as it is rare for respondents to participate in both programmes at the same time (less than 2%, see Table A.3).

Table 4.1 presents the entitlements and benefit levels of the OPP. The first aspect of information shown by the table is that the major participants of this programme are urban residents and that very few rural residents have participated in the programme. According to Table 4.1, 80% of urban men and 68.7% of urban women are either recipients or contributors to this programme whereas more than 90% rural residents are not participants of this programme.

The second aspect of information is that respondents above the SPA are more more likely to be recipients. There is a much higher proportion of recipients and a much lower proportion of

participants within groups above the SPA and it can thus be inferred that most of the contributors become recipients once they approach the SPA.

The third aspect of information is that the proportion of non-participants is higher amongst younger age groups. For instance, about 44% of urban residents aged 45-49 were not participants of the programme in 2013. The lower participation rates of younger age groups are related to the changes in the labour market and the public pension system since the 1990s; urban employees who began their career lives after the reform of the pension system were no longer universally covered by the OPP (see Section 1.4). Besides, the emergence of flexible workers in recent years and their less attachment to the public pension system contribute to the lower participation rates of younger age groups as well. The lower participation rates of the current younger age groups raise questions about their future financial well-being when they become older and stop working.

Table 4.2 reflects the access to the RSPP. First, in terms of the coverage of this programme, more than 70% of rural residents and about 20% urban residents were participants in 2013 (either contributors or recipients). Combining the information in Tables 4.1 and 4.2, most urban residents were covered by either the OPP or the RSPP, but about 20% of rural residents were not covered by either programme in 2013. There is uncertainty of their ability to support themselves financially once they stop working at advanced ages.

Second, it can be inferred that most participants of this programme begin to receive benefits around age 60 as the proportions of recipients is much higher amongst groups older than 60 than younger age groups. Third, similar to the case of urban residents, the proportion of non-participants is slightly higher for younger rural residents. For rural men and women, the 45-49 age group reported the highest proportion of non-participants (31.3% and 32.5%). This programme may seem to be more beneficial to those approaching age 60 or older as they only pay for a few years of pensions or they begin to receive the pension benefits immediately. As the minimum year of payment will finally raise to 15 years after the initial promotion period, it raises concerns on the sustainability that whether rural residents will continue to stay in this programme.

In addition, Tables 4.1 and 4.2 show that there are gaps in the pension benefits between urban and rural residents. The pension income of rural residents is much lower than their urban counterparts. The median value of pension benefits of the OPP are 2,100, 1,685, 1,500 and 1,000 CNY per month for the four subgroups respectively; the differences between urban and rural residents are slight. In contrast, the median value of pension benefit of the RSPP is much differentiated. The median value of pension benefits for urban men and women are 760 and 550 CNY per month but only 60 CNY per month on average for rural men and rural women. These figures indicate that older rural residents are more vulnerable, being more exposed to financial

Table 4.1 Entitlements of the Occupational Pension Programme in 2013 and the median value of benefits levels by age group (Sample A, percentage)

a) Urban men

	Overall	45-49	50-54	55-59	60-64	65-69	70-74	75+
Entitlement								
Recipient	56.8	3.0	6.0	17.4	67.1	82.8	82.9	83.6
Contributor	23.2	52.6	61.3	50.8	9.4	3.4	1.4	2.3
Neither	20.0	44.4	32.7	31.8	23.5	13.8	15.7	14.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pension benefits (Median value)	2,100	1,333	1,764	1,844	2,381	2,345	2,437	2,799
Valid N	2,061	232	318	358	373	298	217	265

b) Urban women

	Overall	45-49	50-54	55-59	60-64	65-69	70-74	75+
Entitlement								
Recipient	58.0	7.2	46.7	60.8	63.1	55.1	63.7	57.4
Contributor	10.7	48.1	19.6	4.9	1.9	1.0	0.6	2.1
Neither	31.3	44.7	33.6	34.3	35.0	44.0	35.7	40.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pension benefits (Median value)	1,685	1,381	1,500	1,600	1,700	1,600	1,818	1,800
Valid N	1,854	293	321	348	317	210	170	195

c) Rural men

	Overall	45-49	50-54	55-59	60-64	65-69	70-74	75+
Entitlement								
Recipient	4.4	0.2	0.3	0.9	3.6	3.7	5.1	5.8
Contributor	3.8	8.0	7.1	4.9	2.2	1.5	0.8	0.5
Neither	91.8	91.8	92.6	94.2	94.2	94.8	94.1	93.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pension benefits (Median value)	1,500	235	495	850	1,500	1,700	1,560	1,600
Valid N	6,308	910	1,065	1,216	1,204	786	528	599

d) Rural women

	Overall	45-49	50-54	55-59	60-64	65-69	70-74	75+
Entitlement								
Recipient	1.7	0.0	0.9	1.3	1.2	1.4	1.3	0.9
Contributor	1.9	6.3	2.4	1.7	0.6	0.4	0.6	0.6
Neither	96.4	93.7	96.7	97.1	98.1	98.3	98.1	98.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pension benefits (Median value)	1,000	NA	1,000	1,015	1,000	900	1,350	1,450
Valid N	7,008	1,198	1,235	1,253	1,290	817	536	679

Note: The median value of pension benefits is calculated based on the group of pension recipients.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Table 4.2 Entitlements of the Residents' Social Pension Programme in 2013 by age group (Sample A, percentage)

a) Urban men

	Overall	45-49	50-54	55-59	60-64	65-69	70-74	75+
Entitlement								
Recipient	4.9	0.0	0.3	0.8	8.9	9.2	9.7	6.1
Contributor	7.1	16.7	13.7	14.4	2.4	0.3	0.5	0.4
Neither	88.0	83.3	86.0	84.8	88.7	90.5	89.9	93.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pension benefits								
(Median number)	760	NA	1,400	2,100	600	800	785	790
Valid N	2,061	232	318	358	373	298	217	265

b) Urban women

	Overall	45-49	50-54	55-59	60-64	65-69	70-74	75+
Entitlement								
Recipient	10.7	0.3	3.8	8.9	12.7	26.2	20.1	13.4
Contributor	7.5	20.9	12.2	8.7	2.5	0.5	0.0	0.0
Neither	81.7	78.8	84.0	82.4	84.8	73.3	79.9	86.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pension benefits								
(Median number)	550	NA	1,250	965	450	520	500	480
Valid N	1,854	293	321	348	317	210	170	195

c) Rural men

	Overall	45-49	50-54	55-59	60-64	65-69	70-74	75+
Entitlement								
Recipient	33.1	0.2	0.2	1.0	55.3	75.9	74.2	69.7
Contributor	41.0	68.5	68.8	74.6	3.8	2.0	1.7	1.3
Neither	26.0	31.3	31.1	24.4	20.9	22.1	24.1	28.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pension benefits								
(Median number)	60	305	55	60	60	60	55	55
Valid N	6,308	910	1,065	1,216	1,204	786	528	599

d) Rural women

	Overall	45-49	50-54	55-59	60-64	65-69	70-74	75+
Entitlement								
Recipient	32.9	0.3	1.5	3.5	56.4	75.2	76.4	72.0
Contributor	42.0	67.1	72.3	72.2	23.6	1.8	2.1	1.3
Neither	25.1	32.5	26.2	24.3	20.0	23.0	21.6	26.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pension benefits								
(Median number)	60	108	508	60	60	60	60	55
Valid N	7,008	1,198	1,235	1,253	1,290	817	536	679

Note: The median value of pension benefits is calculated based on the group of pension recipients.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

difficulties when they lose the ability to work, as the pension benefits of rural residents are generally much lower than the household expenditure per capita- particularly the case in rural areas (4,747 and 4,719 CNY for rural men and rural women respectively, see Table A.3). This fact may explain their greater dependence on the intergenerational material transfers from their adult children, which is further discussed in Section 4.4.2.

The descriptive results above show that the differences in pension entitlements and pension benefits may explain the urban-rural differences and gender differences in labour force participation. The author further tests the association between the receipt of pensions and labour force participation using bivariate analysis. Figure 4.8 shows that the recipients of the OPP have a higher probability of being economically inactive than the contributors and non-participants. A similar association is found for the RSPP (see Figure B.3). These results indicate that pension benefits contribute to the adequate financial resources in later life which support older adults to afford the option of not working.

Figure 4.8 Labour force participation in 2013 by entitlements of the Occupational Pension Programme (Sample A)

Note: The Chi-square tests are significant for all of the four subgroups at the 95% confidence level (p-value <0.05).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

4.4 Labour force participation and family characteristics

Section 4.4 investigates the differences in labour force participation in relation to family characteristics. Family characteristics from three aspects are analysed, including marital status (Section 4.4.1), intergenerational material transfers (Section 4.4.2) and the care provision to family members (Section 4.4.3). These factors have been found to be important in explaining labour force participation in existing literature but are less studied in the Chinese context (see Section 2.4.6). In each section, the distribution of each characteristic is presented at the beginning, followed by cross-tabulations and Chi-square tests on the association between family characteristics and labour force participation rates in 2013.

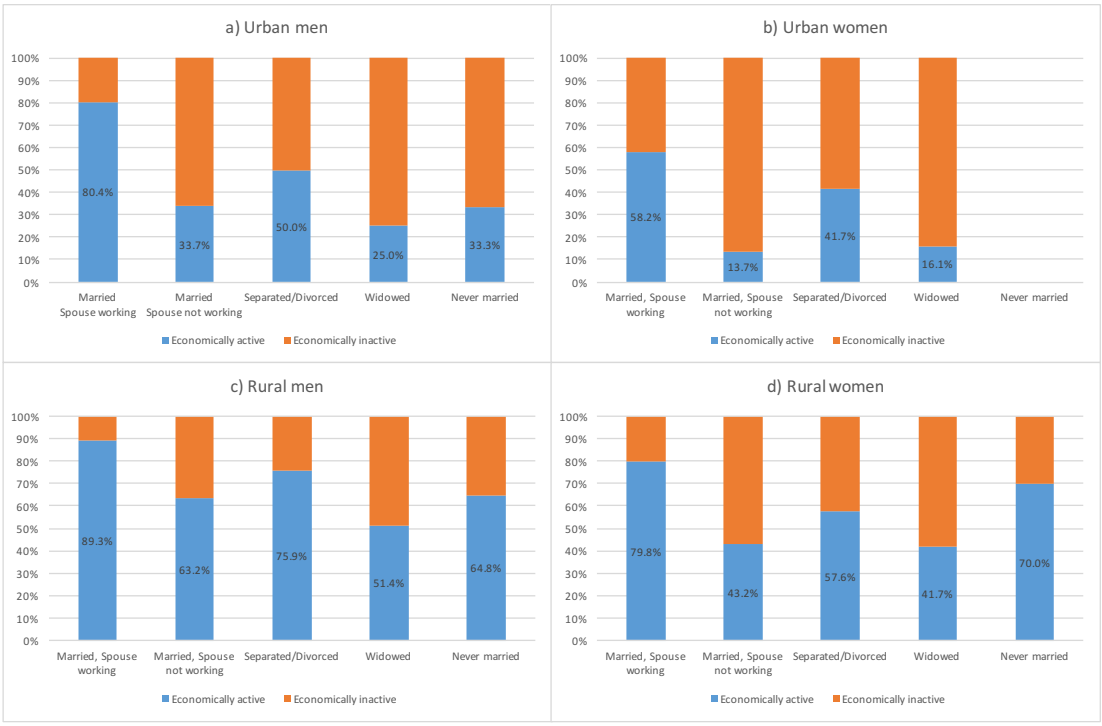
4.4.1 Marital status

Marital status is an important family characteristic that is related to labour force participation; existing literature showed that the married individuals and those with working spouses are related to a higher probability of labour force participation (e.g. Michaud, 2003; Smeaton and McKay, 2003; see Section 2.4.6.1). This section focuses on the association between marital status and labour force participation as well as the propensity towards joint retirement of couples.

In terms of marital status, most individuals have experienced marriages in their past lives and are still married. The statuses of being divorced (or separated) and being never married over the life course are uncommon (less than 2% and 1% respectively, see Table A.3). Females are more likely to be widowed and live without spouses than men (15% compared to 5%).

Figure 4.9 reports the association between labour force participation and marital status (including the work status of spouses). According to this figure, the respondents who are married and who are living with working spouses have the highest labour force participation rates across the four subgroups; the respondents with non-working spouses have much lower labour force participation rates. The variations in labour force participation between the two groups indicates that spouses tend to make joint labour market decisions. Besides, those who are widowed have the lowest labour force participation rates, which may be related to their advanced ages in general.

Figure 4.9 Labour force participation in 2013 by marital status (Sample A)



Note: 1) The never married group of urban women is very small (N<5) and is not included in the Chi-square tests. 2) The Chi-Square tests are significant for all of the four subgroups at the 95% confidence level (p-value <0.05).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

4.4.2 Intergenerational material transfers

Existing literature has shown that financial obligations to younger children can result in a higher probability of the labour force participation of the parents (e.g. Loretto and Vickerstaff, 2012, see Section 2.4.6.2). In contrast, less research attention is paid to the impact of the receipt of material transfers from other family members on labour force participation. This section analyses whether older adults' material transfers with their children and parents (in both directions) are related to their labour force participation.

The material transfers between older adults and their children are frequent; urban residents are more likely to provide material transfers to their children and less likely to receive material transfers than their rural counterparts. According to Table 4.3, more than half of urban residents have material transfers with their children in 2013; amongst them, net recipients (i.e. receive material transfers from children but do not provide transfers to children) are the largest group. About 70% of rural residents have material transfers with their children and about 50% of them are net recipients.

The material transfers between older adults and their parents are less frequent. Only about 35% of respondents have material transfers with their parents, and the majority of them provide

material transfers to their parents but do not receive any transfers (Table 4.3). This is possibly due to the fact that respondents from higher age groups do not have no surviving parents.

These results show that the material transfers with family members can be an important part of the lives of older adults in China. Next, the association between material transfers and labour force participation is tested. According to Figure 4.10, net recipients have the lowest labour force participation rates. The association is in accordance with the anticipation that the material transfers received from family members are a supplementary income source and lower the probability of labour force participation, whereas the material transfers given to family members mean an extra expenditure that increases the probability of labour force participation. However, the differences in the labour force participation rate are relatively small. Such associations are further tested by multivariate analysis in Chapters 7 and 8.

The results of the material transfers with parents are similar – net recipients have lower labour force participation rates than net providers and the respondents with transfers in both directions (Figure 4.11). The group without material transfers has the lowest labour force participation rate, which may be explained by the advanced ages of individuals who have no surviving parents rather than the fact that they have no transfer with their parents.

Table 4.3 Intergenerational transfers with children and parents, by living area and gender
(Sample A, percentage; extracted from Table A.3)

a) Material transfers with children

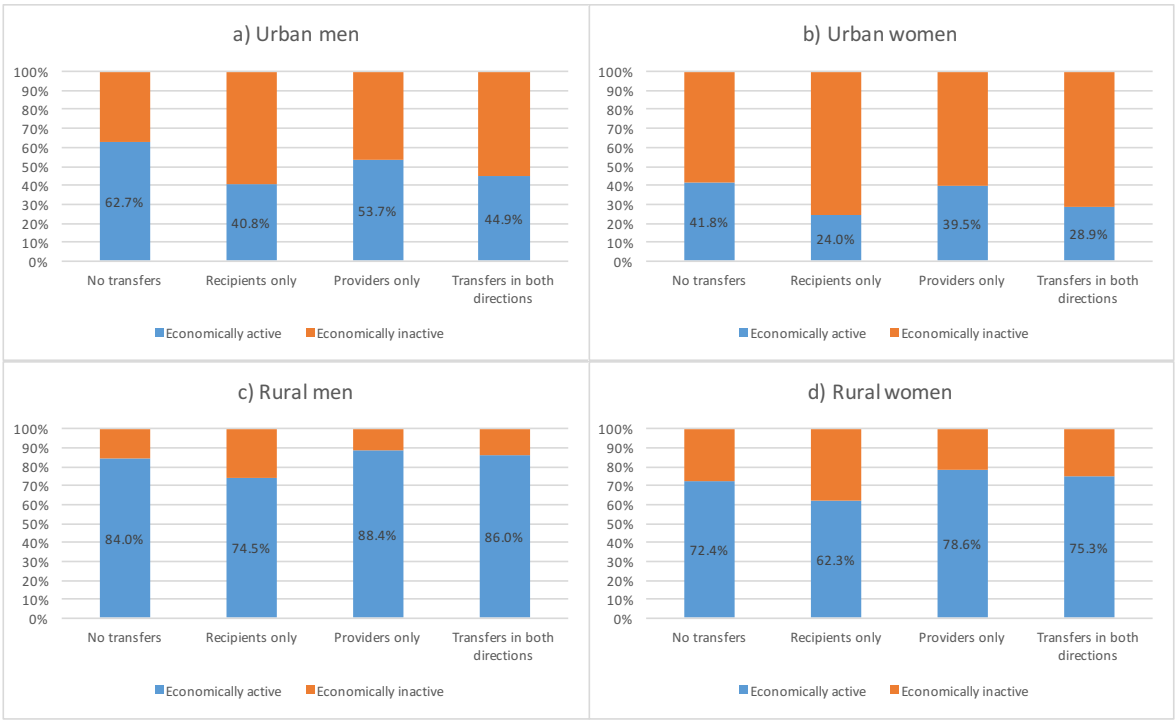
	Urban men	Urban women	Rural men	Rural women
No transfers	42.4	44.4	32.2	27.8
Recipients only	30.8	30.2	46.3	50.4
Providers only	6.5	6.1	3.7	3.3
Transfers in both directions	20.3	19.2	17.8	18.5
Total	100.0	100.0	100.0	100.0
Valid N	(2,071)	(1,859)	(6,343)	(7,043)

b) Material transfers with parents

	Urban men	Urban women	Rural men	Rural women
No transfers	64.5	64.6	64.8	67.6
Recipients only	1.0	1.1	0.7	0.7
Providers only	30.5	30.3	32.4	30.0
Transfers in both directions	4.1	4.0	2.1	1.8
Total	100.0	100.0	100.0	100.0
Valid N	(2,071)	(1,859)	(6,343)	(7,043)

Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Figure 4.10 Labour force participation in 2013 and the material transfers with children (Sample A)



Note: The Chi-square tests are significant for all of the four subgroups at the 95% confidence level (p-value <0.05).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Figure 4.11 Labour force participation in 2013 and the material transfers with parents (Sample A)

Note: The Chi-square tests are significant for all the four subgroups at the 95% confidence level (p-value<0.05).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

4.4.3 Care provision to family members

Existing literature has shown a negative impact of informal care provision on labour force participation, either on the working hours or the probability of staying in the labour market (e.g. Heitmueller and Michaud, 2006, see Section 2.3.5.3). This section analyses the impact of care provision to family members. The upstream care provision to parents and the downstream care provision to grandchildren are analysed separately as relevant studies in the Chinese context have shown that the impact of care provision can vary according to the relationship between care recipients and care providers (Liu, *et al.*, 2010). The author is especially interested in the impact of the care provision to grandchildren, which is becoming an increasingly important part of the life of older adults (Hochman and Lewin-Epstein, 2013). The care provision to children is not analysed since the average age of the youngest surviving children is about 29 (see Table A.3), which means that most children are adults and do not rely on care provision from parents anymore. The time spent on care provision to spouses is not analysed either since it is not available from the CHARLS.

Table 4.4 shows that older adults provide intensive caregiving to their grandchildren. More than 30% of respondents reported to do so in 2013. The average caring hours amongst those with care provision to their grandchildren is approximately 29 for men and 40 for women. These figures indicate that these caregivers are very likely to provide care to their grandchildren on a daily basis. Such findings echo the results of existing studies that the care provision to grandchildren is intensive in countries where both the public caring services available for grandchildren and parental leave are scarce (Bordone *et al.,* 2016). In addition, females are more likely to be caregivers and spend more hours on caregiving as well.

The care provision to parents is less intensive than the care provision to grandchildren. Only about 14% of urban residents and 9% of rural residents reported doing so in 2013 (Figure 4.4). The average caring hours are similar across all of the four subgroups (about 14 hours per week). In addition, there are few gender differences concerning the care provision to parents. These results indicate that the upstream and downstream care provisions may have different natures. The lower intensity of the care provision to parents may indicate the time commitment to parents is on a weekly basis and may not interfere with work.

More importantly, it is notable that older adults who work and provide informal care to family members at the same time may suffer from a heavy burden due to their working and caring hours being more than 70 hours per week on average in total. Their intensive care provision further highlights the potential negative impact of caring obligations on labour force participation.

Table 4.4 Care provision to grandchildren and parents, by living area and gender (Sample A, percentage, extracted from Table A.3)

a) Care provision to grandchildren

	Urban men	Urban women	Rural men	Rural women
Care provision				
No care provision	69.9	68.3	68.5	60.9
Less than 10 hours per week	8.1	7.9	8.8	8.5
10 - 20 hours per week	3.8	3.7	4.1	4.4
More than 20 hours per week	18.3	20.1	18.6	26.2
Total	100.0	100.0	100.0	100.0
Caring hours (Median number)	29.5	42.2	29.2	46.1
Valid N	2,048	1,846	6,320	7,017

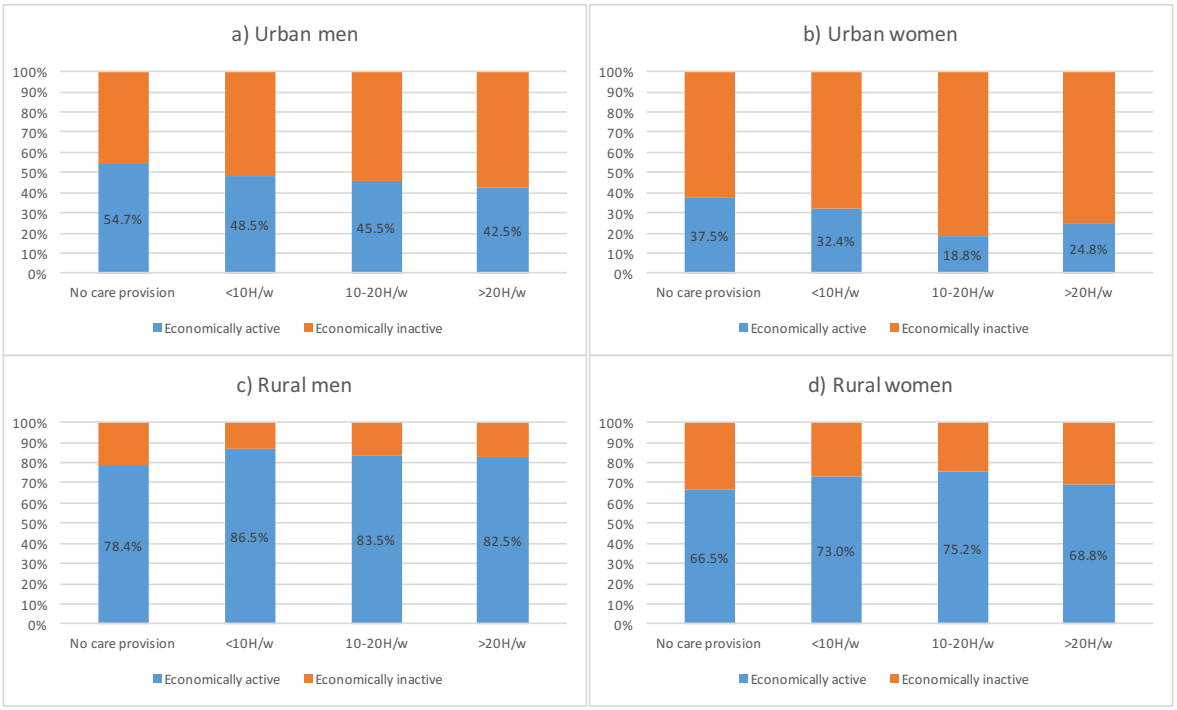
b) Care provision to parents

Care provision				
No care provision	85.3	84.6	90.9	91
Less than 10 hours per week	8.8	10.1	5.2	5.7
10 - 20 hours per week	3.9	2.4	2.6	1.8
More than 20 hours per week	2.1	2.9	1.3	1.6
Total	100.0	100.0	100.0	100.0
Caring hours (Median number)	12.8	14.7	14.2	14.2
Valid N	2,071	1,859	6,343	7,043

Note: The median number applies to respondents with care provision; non-caregivers are not included.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

In terms of the relationship between care provision and labour force participation, the two groups Chi-square tests are significant across all of the four subgroups (Figure 4.12 and Figure B.5). On the one hand, urban residents (especially urban women) providing care provision to their grandchildren have a lower probability of working, whereas the differences in labour force participation amongst rural residents are small. On the other hand, respondents who provide care to their parents are more likely to work. These results indicate that care provision for grandchildren and care provision for parents have different meanings with respect to the labour force participation of older adults and also for urban-rural differences. The care provision to grandchildren appear to be time commitments to the actual caregiving tasks and can have a negative impact on labour force participation. The time spent on the care provision to parents may indicate the contacts with parents and the financial responsibility to parents rather than the actual caregiving obligations. However, further multivariate analysis is needed.

Figure 4.12 Labour force participation in 2013 by care provision to grandchildren (Sample A)



Note: The Chi-square tests are significant for all of the four subgroups at the 95% confidence level (p-value <0.05).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

4.5 Chapter summary

This section summarises the main findings of the current chapter. As the first empirical chapter of this thesis, this chapter provides descriptive results on the labour force participation of older adults in 2013 and presents the remarkable differences in labour force participation between different social groups. In terms of the thesis structure, this chapter works as a baseline for further analysis on the patterns of labour market behaviour in Chapters 5 and 6, where the dynamics of labour market behaviour over time are investigated. Moreover, this chapter reveals the associations between individual and family characteristics and labour force participation, which shed light on the explanation of the urban-rural differences and gender differences in labour force participation.

The most significant differences in labour force participation exist between urban and rural residents. In terms of labour force participation rates, rural residents are much likely to work than urban residents and a great number of rural residents remain in the labour market at advanced ages. For urban residents, there is a gap in the participation rates around the SPA of the OPP. In terms of economic activity status and work intensity, the majority of urban residents have full-time non-agricultural work whereas rural residents mostly have agricultural work and experience a slightly lower work intensity. The observed urban-rural differences are consistent with findings

in the existing studies (Benjamin et al., 2003; Pang et al., 2004; Giles et al., 2011; Giles et al., 2015). Such patterns reflect the labour market segmentation between urban and rural areas in China and the imbalance between the economy rewards and pension entitlements of residents. Urban residents are more likely to have an attachment to the formal sector than rural residents, to get access to the OPP and have a secured financial income in later life than rural residents. In particular, about one fifth rural residents have net participated any pension programmes so far (see Section 4.3.3). As the process of urbanisation and the migration into urban areas will continue to be the case in China in a long term, the current younger age groups of rural residents may continue to experience these disadvantages under the current institutional background.

The gender differences in labour force participation are smaller than the urban-rural differences. In terms of the labour force participation, men in their fifties have higher labour force participation rates than women since they have not approached the SPA for pension benefits. Compare to this, the lower labour force participation of women is ignorable. Different from the Western context (Levy *et al.*, 2007; Van der Horst *et al.*, 2017), the work intensity of male and female labourers is quite similar- both groups have intensive work (with a high proportion of full-time). These results indicate the prevalence of a more egalitarian dual-earner family model in China instead of the male breadwinner model. In addition, there is great potential of improving the labour force participation of women in their fifties, but the adjustment of relevant polices is required to support such changes.

The second aspect of information discussed in this chapter is the differences in labour force participation associated with individual and family characteristics. In terms of individual characteristics, health status appears to be an important push factor of staying in the labour market, whilst financial status of individuals may work as a pull factor that facilitates the labour market exit. Individuals with poor health status have lower labour force participation rates; the negative association between labour force participation and health status is more pronounced amongst rural residents, which implies that health status is more critical to agricultural work. In addition, the differences in labour force participation in relation to the prevalence of chronic illnesses are smaller compared to the prevalence of IADL difficulties. This may mean that not all chronic illnesses are as serious as ADL or IADL difficulties and thus they may not stop people from working directly in most cases; similar propositions have been discussed in the work of Wilson (2001).

In terms of the associations between SES and labour force participation, educational attainment and house ownerships are positively related to labour force participation, whilst the differences in labour force participation between groups with different household expenditure are small. These

results do not support the author's assumptions that better SES, as better long-term financial status, is related to and a lower probability of labour force participation. One possible explanation presented in existing literature in the Chinese context is that those with better SES have the higher opportunity cost of forgoing their present income and the stronger feelings of social participation as a strong motivation (Pang *et al.*, 2004; Zhang, 2010). Further multivariate analysis is conducted to test these associations in Chapters 7 and 8.

Respondents receiving pension benefits from the OPP and the RSPP is related to lower labour force participation rates than the contributors and non-participants. These results highlight the importance of pension benefits as the major income source (and cash flow) in later life. However, results also show the benefit levels of the RSPP is low - as this is the main programme that the rural residents participated in, results in this chapter raises questions on the sufficiency of the financial support that rural residents can receive in later life.

In terms of family characteristics, all of the three aspects that are investigated in this chapter are significantly related to the labour force participation of older adults. These results confirm the importance of the interaction with family members on individuals' labour market decisions, which is under-researched in studies in the Chinese context and requires further analysis. While the pension system appears to be an important factor that shapes the labour market behaviour and gender differences, the impact of family factors is not ignorable. Firstly, there is heterogeneity in labour force participation between groups with different marital status. The married individuals with working spouses have the highest labour force participation rates; the divorced and the never married individuals have moderate labour force participation rates; the married individuals with non-working spouses and the widowed individuals have the lowest labour force participation rates. In addition to the preference for leisure with couples, these differences may result from individuals' contacts with other family members and their living arrangement as well.

Secondly, receiving intergenerational material transfers is related to higher labour force participation rates, whereas providing material support to family members is related to lower labour force participation rates. The material transfers from family members can work as a supplementary income source or extra expenditure for older adults. The fact that older adults have intensive material transfers with their children highlights its importance in shaping labour market behaviour.

Thirdly, the care provision to grandchildren and parents have different meanings to the labour force participation of older adults. The care provision to grandchildren is intense, especially amongst urban and rural women, and can be a part of their daily life. On the other hand, the care provision to parents is less intense, and there appears to be no gender differences in the care

provision to parents. The care provision to grandchildren is related to lower labour force participation rates, whilst the care provision to parents is related to higher labour force participation rates. These results indicate the different natures of the care provision to grandchildren and parents, and the care provision to grandchildren requires much greater time commitments.

These results with respect to individual and family characteristics provide further information on the urban-rural and gender differences. In terms of the urban-rural differences, rural residents experience disadvantages across different domains in later life. The disadvantages they experienced are not limited to the economy rewards from work and pensions as discussed earlier, but also in other realms, such as health status and family obligations. For instance, rural residents are more likely to experience the disadvantages from the burden of care provision on the left-behind family members (Wu and Ye, 2016; Ye *et al.*, 2016). In terms of gender differences, women's lower labour force participation is also related to their higher family obligations. Women can be disadvantaged in the workplace by spending more hours on care provision.

The two aspects of main findings in this chapter are summarised as above. Lastly, it is noticeable that the associations between personal characteristics and labour force participation discussed in this chapter can be closely related to increasing age as a third factor. For example, the lower labour force participation of the widowed group may result from the higher age of this group. Table 4.5 provides an example of the association between health status and labour force participation, where the results are considered within each age group separately. The Chi-square tests show that the negative association between IADL difficulties and the probability to work varies; it is not significant for urban men from the 55-59 and 60-64 age groups and urban women. These results reflect that health status is related to the third factors, such as approaching the SPA for a pension and the availability of pension benefits, which can be more important than health status.

Thus, the control of the age variable is important to the analysis in this thesis, since the age indicator can affect the significance and direction of the association between personal characteristics and labour force participation – which is also reflected by in the correlation matrices discussed in Section 3.6.4. To maintain the number of sample size, age is not controlled in the descriptive analysis in Chapters 4 and 5. Yet, to have a full understanding of the interplay of the various factors influencing the labour market behaviour, Chapters 7 and 8 generate further analytical statistics with the control of age effects.

Table 4.5 Significance levels of the negative associations between the prevalence of IADL difficulties and labour force participation (Sample A)

	Urban men	Urban women	Rural men	Rural women
45-49	***	Not significant	***	***
50-54	***	Not significant	***	***
55-59	Not significant	Not significant	***	***
60-64	Not significant	Not significant	***	***
65-69	***	Not significant	***	***
70+	***	Not significant	***	***

Note: The star symbols indicate the p-values for the Chi-square tests, where *** represents $p<0.01$, ** represents $p<0.05$, * represents $p<0.1$.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Chapter 5 Results II: Labour market exit of older adults in China

5.1 Overview

In order to achieve a comprehensive understanding of the labour market behaviour of older adults in China, Chapters 4 to 6 analyse the patterns of labour market behaviour at different time lengths. Based on the snapshots of labour force participation as presented in Chapter 4, this chapter examines the transition into economically inactive status over a four-year period (from 2011 to 2015). This chapter addresses RQ2: *What are the patterns of labour market exit of older adults in China and how do these vary across different social groups?* This chapter first describes the flow of labourers within the older population and the heterogeneity in the labour market exit between urban and rural residents and between men and women. Moreover, this chapter investigates the association between labour market exit and key individual and family characteristics using bivariate analysis, which provides explanations to the urban-rural and gender differences in labour market behaviour. Analysis in this chapter was conducted using Sample B, which includes 9,312 respondents who were aged 45 and over and in the labour market in 2011 (baseline survey), and who were present in the follow-up waves in both 2013 and 2015 (see Section 3.2 for details).

The structure of this chapter is similar to Chapter 4. Section 5.2 presents the patterns of labour market exit over the four years and the differences between urban and rural residents and between men and women. Next, the variations in the transition into economically inactive status status in terms of individual and family characteristics are discussed respectively in Sections 5.3 and 5.4. Lastly, Section 5.5 discusses the main findings from this chapter in comparison to the results in Chapter 4.

5.2 Urban-rural and gender differences in terms of the patterns of labour market exit

Section 5.2 describes the patterns of the labour market exit of older adults over the four-year period from 2011 to 2015. The main study interest here is the proportion of the respondents who experienced labour market exit over the period (referred to as the 'transition rate'); in addition, the economic activity status and work intensity in 2011 of the respondents who left the labour

market are analysed, which add further details to the understanding of the association between working characteristics and labour market behaviour in later life.

Figure 5.1 presents the transition rates of the respondents aged 45 and over in the four-year period from 2011 to 2015 by subgroup (i.e. urban men, urban women, rural men and rural women). First, a common pattern of labour market exit across the four subgroups is that respondents from older age groups have higher transition rates. Taking rural men as an example, the 45-49 age group experienced the lowest transition rate (5.5%) and the 70 and over age group experienced the highest transition rate (43.4%). Second, in terms of the urban-rural differences, rural residents are less likely to experience labour market exit than urban residents. In addition, results show the importance of the SPA in shaping the labour market behaviour of the urban residents. The transition rates of respondents who just approached the SPA of the OPP in 2011 are higher than the adjacent age groups amongst urban residents (44.4% for the 60-64 age group of urban men and 36.3% for the 50-54 age group of urban women); such difference is not found amongst the rural residents. These findings are accordance with the findings on labour force participation in Chapter 4.

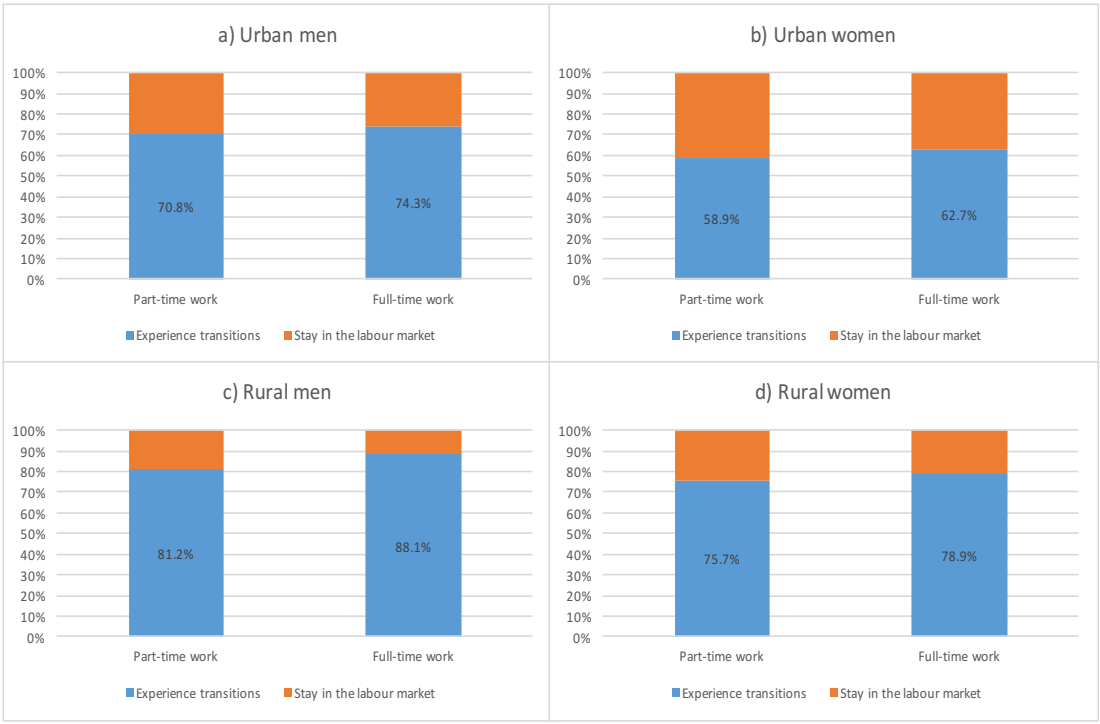
Figure 5.2 presents information on the association between work intensity in 2011 and the transition rate over the study period. The main information here is that the transition rates of full-time workers and part-time workers in 2011 are quite similar. Similar to Figure 4.2 in Section 4.2, Figure 5.2 implies that the labour market exit of older adults is not related to the work intensity of the previous work prior to such labour market decisions. Such inference is further tested by the investigation of work histories in Chapter 6.

Figure 5.3 reflects the transition rates in terms of the economic activities that respondents engaged in in 2011. According to Figure 5.3, respondents who engaged in non-agricultural work in 2011 experienced the highest transition rate. Respondents who engaged in agricultural work and who had both agricultural and non-agricultural work at the same time in 2011 experienced the lowest transition rates in the subsequent four years. The Chi-square tests confirm the significant association between the labour market exit and economic activities across all of the four subgroups. In this sense, the urban-rural differences in the transition rates can be largely explained by their economic activities and the public pension system, as urban residents are more likely to have non-agricultural work and work as employees in the formal sector and have access to pensions than their rural counterparts.

Figure 5.1 Transition into economically inactive status over the period from 2011 to 2015 by living area, gender and age group (Sample B)

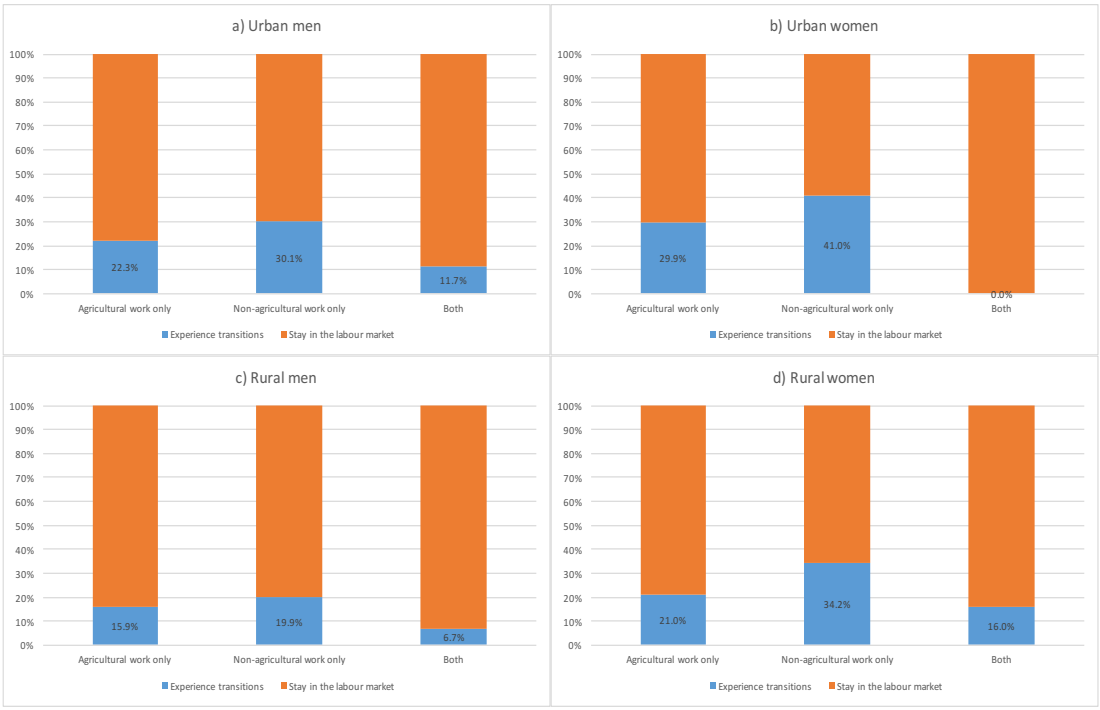
Note: 1) Respondents' age at Wave 1 (2011) is presented (the same for all figures in this chapter). 2) The Chi-square tests are significant for all of the four subgroups at the 95% confidence level; the '70 and over' age group of urban women is not included in the Chi-square tests due to the small number of observation.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Figure 5.2 Transition into economically inactive status by work intensity in 2011 by living area, gender and age group (Sample B)



Note: The Chi-square tests are only significant for rural residents at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Figure 5.3 Transition into economically inactive status by economic activity in 2011 (Sample B)



Note: The Chi-square tests are significant for all of the four subgroups at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

5.3 Labour market exit and individual characteristics

Section 5.2 has discussed the urban-rural and gender differences regarding the transition into economically inactive status. Section 5.3 investigates the variations in the transition rates between groups with different individual characteristics, including health status (Section 5.3.1), SES (Section 5.3.2) and the receipt of pensions (Section 5.3.3). Chapter 4 has shown the potential impact of these individual characteristics on labour force participation, and this chapter further investigates their importance concerning the work transitions over a short period.

The discussions on their impact begin with the presentation of the distribution of these characteristics in 2011 and the changes in these characteristics over the four years (see Table A.4 for the full results of the profile of Sample B). Next, the associations between the labour market outcomes over the four years and individual characteristics are tested using cross-tabulations and Chi-square tests.

5.3.1 Health status

Chapter 4 has shown that respondents with poor health status have significantly lower labour force participation rates. This section further investigates whether the transition into

economically inactive status is related to health status. The changes in health status over the four-year period are shown in Table 5.1. In terms of the prevalence of IADL difficulties, respondents without IADL difficulties in both 2011 and 2015 over the period account for the largest group (more than 80% urban residents and about 70% rural residents). Respondents who reported deteriorated health status since 2011 account for the second largest group, amongst which rural residents slightly outnumbered urban residents (10.5% and 16.5% for rural residents, 6.2% and 7.3% for urban residents). A lower proportion of respondents reported IADL difficulties in both waves and the smallest group is respondents who reported improved health status over the period. In terms of the distribution of chronic illnesses, more than 70% respondents have chronic illnesses in at least one wave and more than 60% of respondents reported having chronic illnesses in both waves. There is no category for "having any chronic illnesses in 2011 and not having any chronic illnesses in 2015" as the prevalence rate of chronic illness do not reverse in most cases. Both indicators reflect a moderate deterioration in health status over the four years, which is very likely to have an impact on labour market behaviour.

Next, the associations between the transition into economically inactive status and the changes in health status over the period are investigated. According to Figure 5.4, urban men with deteriorated health status (no difficulties in 2011 and having difficulties in 2015) have significantly higher transition rates than those with good health status in both 2011 and 2015, whilst such differences are slight and not significant for urban women. Respondents with poor health status in both waves and with improved health status are not included due to their small numbers. For rural residents, respondents who reported the same health status in both years are less likely to experience labour market exit, whilst those reported changes in health status (either deteriorated or improved) have higher transition rates. While chi-square tests show that there are differences between the four categories, it is not possible distinguish the causality between health changes and labour market exit, and thus further multivariate analysis is required.

On the other hand, the association between the transition into economically inactive status and the prevalence of chronic illnesses is only significant amongst rural residents (see Figure B.7); having any chronic illness (whether since the beginning of the period or started during the period itself) is related to higher transition rates. It appears that the prevalence of IADL difficulties is more strongly related to the transition into economically inactive status than chronic illnesses, which is consistent with findings in Chapter 4.

Combining the information in relation to the two indicators of health status, health status is shown to be important concerning the labour market behaviour of rural residents but may not

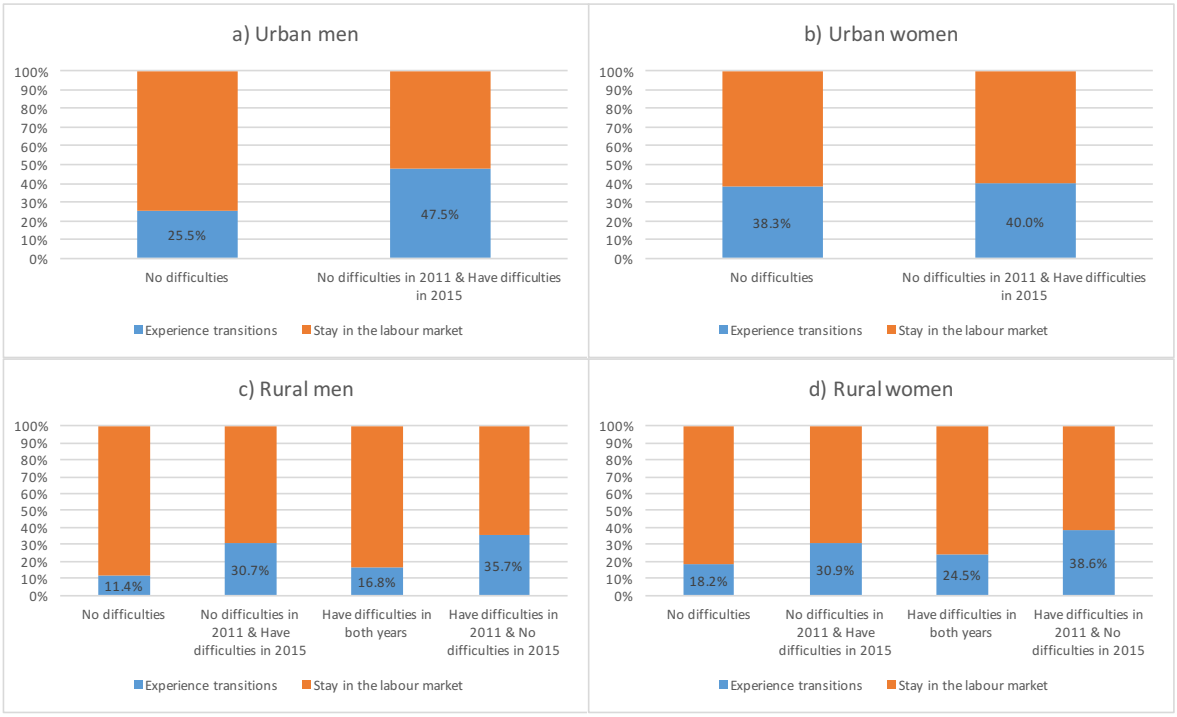
have a critical impact on the transition into economically inactive status of urban residents over a relatively short period.

Table 5.1 Changes in health status from 2011 to 2015 (Sample B, percentage)

	Urban men	Urban women	Rural men	Rural women
Prevalence of IADL difficulties				
No difficulties in 2011 & 2015	87.4	83.9	78.0	63.3
No difficulties in 2011 & Difficulties in 2015	6.2	7.3	10.5	16.5
Have difficulties in 2011 & 2015	4.7	5.3	7.5	11.5
Difficulties in 2011 & No difficulties in 2015	1.7	3.5	4.0	8.8
Total	100.0	100.0	100.0	100.0
Valid N	641	342	4,196	4,132
Prevalence of any chronic illnesses				
No chronic illnesses in 2011 & 2015	24.5	27.5	24.4	20.6
No chronic illnesses in 2011 & Illnesses in 2015	9.2	12.3	12.4	10.8
Have chronic illnesses in 2011 & 2015	66.3	60.2	63.2	68.7
Total	100.0	100.0	100.0	100.0
Valid N	641	342	4,197	4,132

Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Figure 5.4 Transition into economically inactive status by changes in IADL difficulties (Sample B)



Note: 1) The other two categories of urban residents are omitted due to their small sizes. 2) The Chi-square tests are significant for urban men, rural men and rural women at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

5.3.2 Socioeconomic status

Chapter 4 has provided cross-sectional evidence that SES and labour force participation is significantly associated with each other; better educational attainment and having house ownerships are related to higher labour force participation, whereas the differences in labour force participation in relation to household expenditure per capita are small. This section investigates the impact of SES as measured in 2011 on the transition into economically inactive status over the next four years. The changes in SES are not analysed as SES is quite stable over the period (see Table A.4). For instance, the house ownership in 2011 and 2015 is similar (around 85% and the changes are only about 4%.

The associations between the SES in 2011 and the labour market exit in the subsequent four years are presented in Figures B.7, B.8 and B.9 in Appendices B. Higher educational attainment levels are only found to be related to slightly lower transition rates amongst rural residents (see Figure B.7). Regarding housing tenure, rural residents without house ownership have a higher transition rate. The differences in the transition rates between groups with and without household ownership are small amongst urban residents (see Figure B.8). Concerning household expenditure, rural residents who ranked the lowest are the most likely to leave the labour market than other groups with better SES (see Figure B.9).

To summarise, the impact of SES on labour market exit is restricted to rural residents, and a positive association between SES and labour force participation is found. These results confirm that the meaning of SES is not restricted to finances.

5.3.3 Pension entitlements

Chapter 4 has shown that there are great variations in the pension entitlements and the pension benefits amongst older adults, which appear to have an impact on their labour force participation. This section examines the changes in the pension entitlements and their association with labour market exit.

Tables 5.2 and 5.3 show the pension status of the OPP and the RSPP over the four-year period. Similar to Chapter 4, the two programmes are examined separately as it is rare for the respondents to participate in both programmes at the same time (less than 2%, see Table A.4). The first row of Tables 5.2 and 5.3 shows that the recipients of pensions in 2011 remained to be recipients in 2015. The study focus is the figures in the second and the third rows, which reflect the changes in the pension status over the period of contributors and non-participants at Wave 1 (in 2011). In terms of the OPP, urban residents remained to be the major participants, and

changes in rural areas are very rare. For urban residents, a small group of contributors stopped participating in the programme (12.8% and 18.6%) but some previous non-participants began to participate in the programme (20.5% and 3.6%). It is not clear why certain non-participants had become recipients in 2015. The change of status may be related to the slightly different wording of the CHARLS questionnaire so that a few contributors in 2011 and 2013 regarded themselves as non-participants (see also Section 3.6.1.4).

In terms of the RSPP, the main increase in the coverage rates are from rural residents. About 70% of non-participants in 2011 had become either recipients or contributors in 2015, although there is also a small group of rural men and women who reported no longer to be contributors to the programme in 2015 (20.6% and 19.9%). Such changes in the pension entitlement reflects the development of the old-age pension system, where an increase of the coverage of the Residents' Social Pension Programmes has been witnessed. However, the access to the OPP amongst rural residents is still limited, which indicates their financial difficulties in later life.

Table 5.2 Changes in pension status of the Occupational Pension Programme (Sample B)

a) Urban men (Valid N=641)

Status in 2011 \ Status in 2015	Recipient	Contributor	Neither	Total	Valid N
Recipient	100.0	0.0	0.0	100.0	206
Contributor	29.7	57.6	12.8	100.0	172
Neither	31.2	20.5	48.3	100.0	263

b) Urban women (Valid N=342)

Status in 2011 \ Status in 2015	Recipient	Contributor	Neither	Total	Valid N
Recipient	100.0	0.0	0.0	100.0	78
Contributor	24.3	57.1	18.6	100.0	70
Neither	21.6	3.6	74.7	100.0	194

c) Rural men (Valid N=4,197)

Status in 2011 \ Status in 2015	Recipient	Contributor	Neither	Total	Valid N
Recipient	100.0	0.0	0.0	100.0	88
Contributor	13.6	25.5	60.9	100.0	110
Neither	2.5	1.3	96.2	100.0	3,999

d) Rural women (Valid N=4,132)

Status in 2011 \ Status in 2015	Recipient	Contributor	Neither	Total	Valid N
Recipient	100.0	0.0	0.0	100.0	23
Contributor	10.7	8.9	80.4	100.0	56
Neither	1.6	0.4	98.0	100.0	4,053

Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Table 5.3 Changes in pension status of the Residents' Social Pension Programme (Sample B)

a) Urban men (Valid N=641)

Status in 2011 \ Status in 2015	Recipient	Contributor	Neither	Total	Valid N
Recipient	100.0	0.0	0.0	100.0	30
Contributor	12.5	41.7	45.8	100.0	24
Neither	6.1	8.3	85.5	100.0	587

b) Urban women (Valid N=342)

Status in 2011 \ Status in 2015	Recipient	Contributor	Neither	Total	Valid N
Recipient	100.0	0.0	0.0	100.0	21
Contributor	23.8	33.3	42.9	100.0	21
Neither	12.0	10.0	78.0	100.0	300

c) Rural men (Valid N=4,197)

Status in 2011 \ Status in 2015	Recipient	Contributor	Neither	Total	Valid N
Recipient	100.0	0.0	0.0	100.0	469
Contributor	28.1	51.3	20.6	100.0	1,054
Neither	36.0	31.9	32.1	100.0	2,674

d) Rural women (Valid N=4,132)

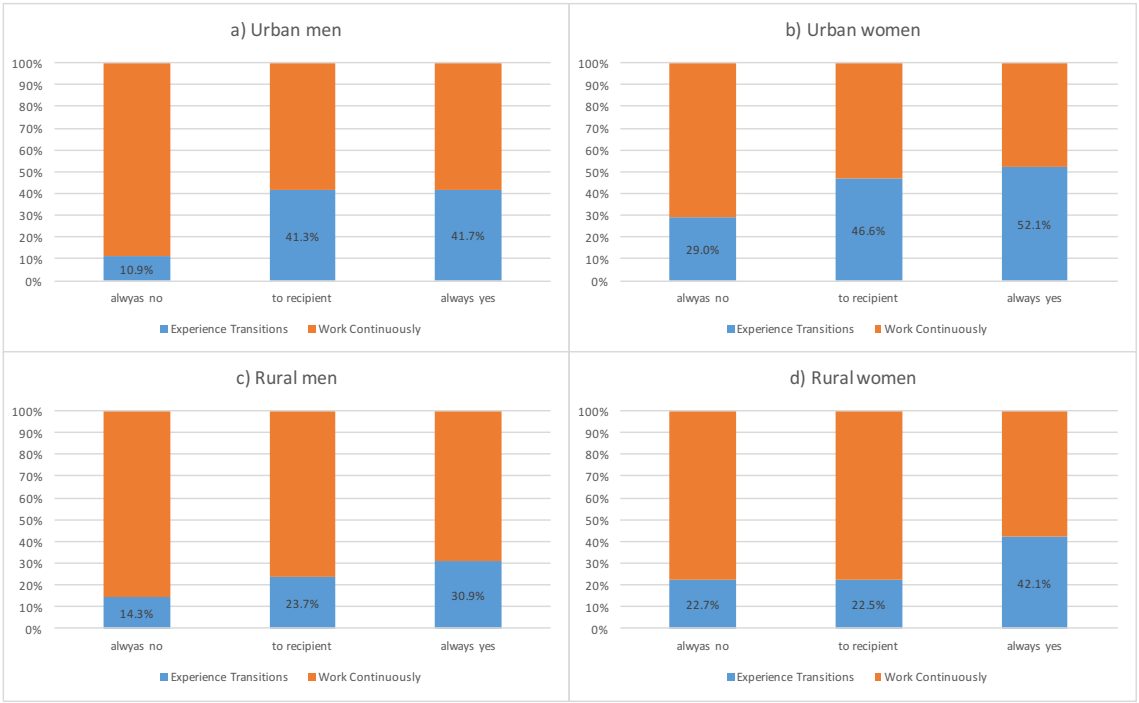
Status in 2011 \ Status in 2015	Recipient	Contributor	Neither	Total	Valid N
Recipient	100.0	0.0	0.0	100.0	463
Contributor	27.0	53.0	19.9	100.0	1,054
Neither	34.1	35.1	30.9	100.0	2,615

Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Next, the associations between the transition into economically inactive status and the pension entitlements are investigated. Figure 5.5 shows the transition rates in relation to the category of becoming the recipients of the OPP; other categories are too small in size and not included. In terms of pension status over the four years, those who had been recipients from 2011 until 2015 have the highest transition rates. The respondents who have become recipients over the study period had moderate transition rates. Non-participants of the programme had the lowest transition rates. Figure B.10 reflects a similar association between receiving benefits from the RSPP and transition rates, which is significant across all subgroups.

The similar associations concerning the two programmes confirms the importance of access to pension benefits in relation to affecting labour market behaviour and its role as a major financial resource in later life. Such an income flow is more important than SES for labour market decisions. Becoming the recipients of the OPP or the RSPP provides secured pension income in later life and works as an important financial incentive for both urban and rural residents. Yet, urban residents received more generous pension benefits than rural residents.

Figure 5.5 Transition into economically inactive status by eligibility of the Occupational Pension Programme over the four years (Sample B)



Note: The Chi-square tests are significant for all of the four subgroups at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

5.4 Labour market exit and family characteristics

Section 5.4 investigates the heterogeneity in labour market exit between groups according to various family characteristics, including marital status (Section 5.4.1), intergenerational material transfers (Section 5.4.2) and the care provision to family members (Section 5.4.3). Chapter 4 has shown the association between these family characteristics and labour force participation; this chapter further analyses their importance in shaping the labour market decisions over a period. Each aspect begins with descriptive results regarding the distribution of these characteristics in 2011 as well as their changes over the next four years if they are time-variant variables (see Table A.4 for the full results of the profile of Sample B). Next, the associations between these characteristics and the transition into economically inactive status are analysed.

5.4.1 Marital status

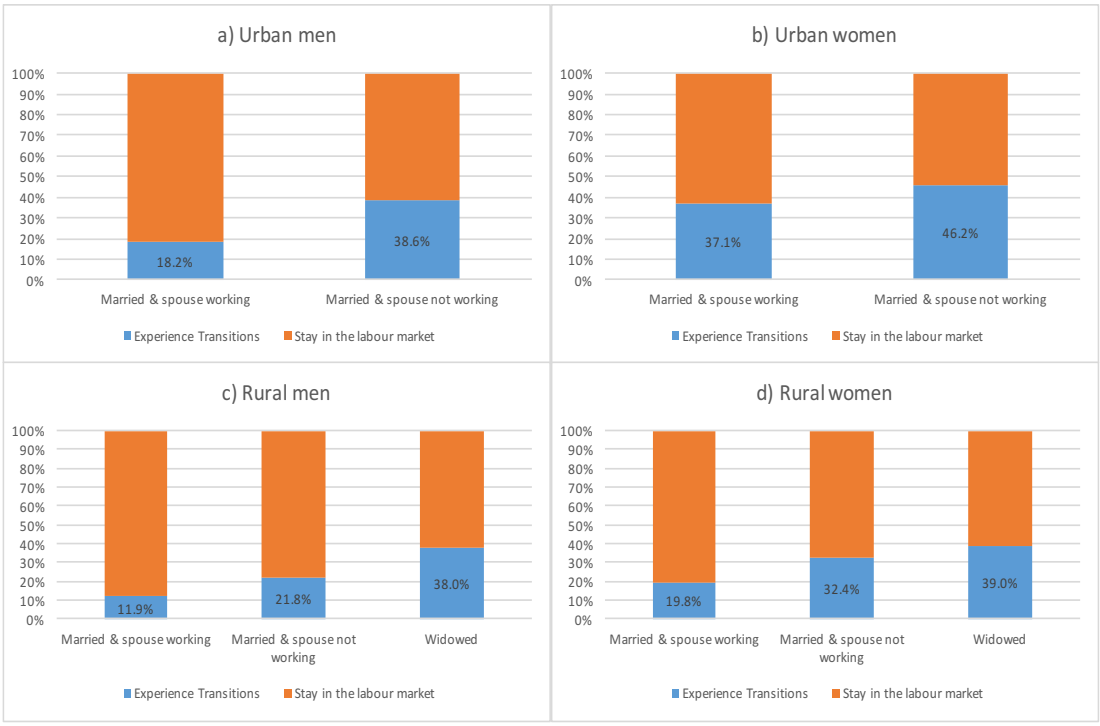
Chapter 4 has shown that the married respondents, especially those with working spouses, have higher labour force participation rates than those with other marital status. This section investigates whether the probability of the transition into economically inactive status is related to marital status.

There are few changes in respondents' marital status over the period. There is a very small increase in the proportion of the widowed group (about 2% in total). Within the married group, there is a decrease in the proportion of individuals with working spouses (about 10%) (see Table A.4). The marital status in 2011 and the changes in marital status over the period are investigated respectively - otherwise the number of observations for each category will be too small for Chi-square tests.

Figure 5.6 shows the association between the transition into being economically inactive and marital status in 2011. These should reflect the impact of marital status on work (if any) as the reverse causality is not possible. According to the figure, the respondents with non-working spouses are more likely to experience a transition into being economically inactive than the respondents with working spouses. The widowed group among the rural residents experience the highest transition rates.

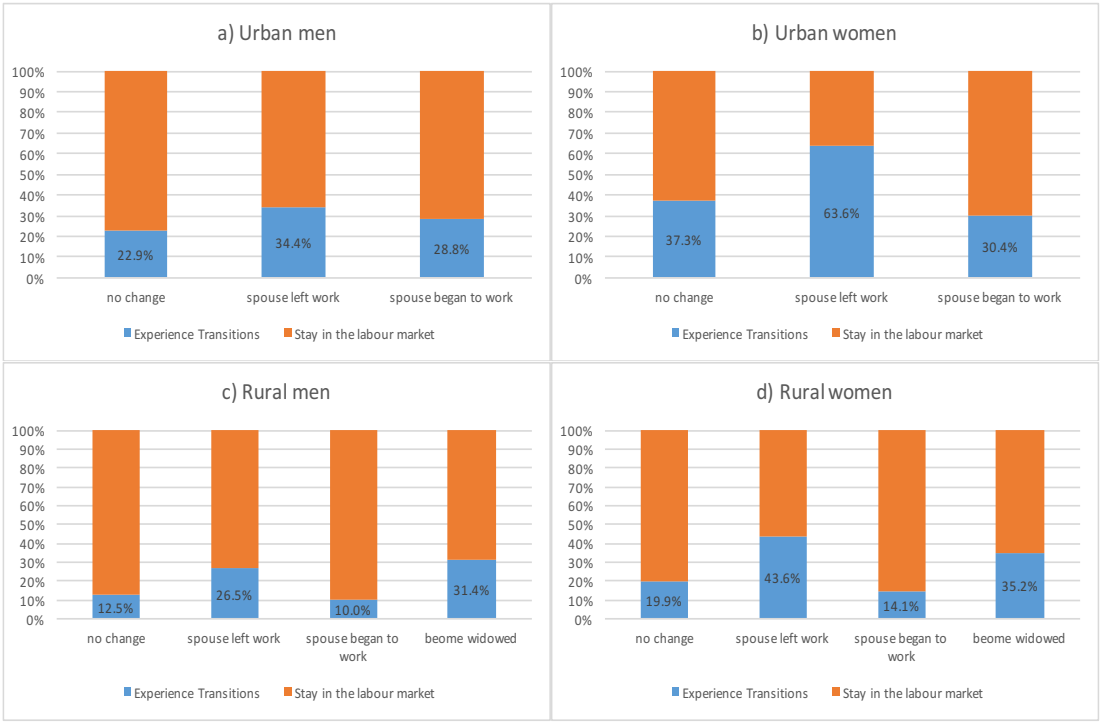
Figure 5.7 shows the association between the transition rates and changes in marital status over the four years. The research interest here is the potential impact of the working status of spouses and becoming widowed, so respondents with other marital status are combined as the 'no change' group. For urban residents, respondents with spouses who had left the labour market over the four years experienced higher transition rates than the other two groups. For rural

Figure 5.6 Transition into economically inactive status by marital status in 2011 (Sample B)



Note: 1) Categories of the widowed and the divorced are omitted for urban residents due to small sample sizes. 2) The Chi-square tests are significant for all subgroups at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Figure 5.7 Transition into economically inactive status by changes in marital status (Sample B)



Note:1) The category of "become widowed" is omitted due to small sample sizes. Respondents with unchanged martial status are combined into one group for similar reasons. 2) The Chi-square tests are significant for all subgroups at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

residents, respondents with spouses who had left the labour market are related to a higher probability of labour market exit as well. Respondents who became widowed also experienced very high transition rates. Figures 5.6 and 5.7 convey similar information that the status of being married and having working spouses are related to lower transition rates. These results are consistent with findings in Chapter 4.

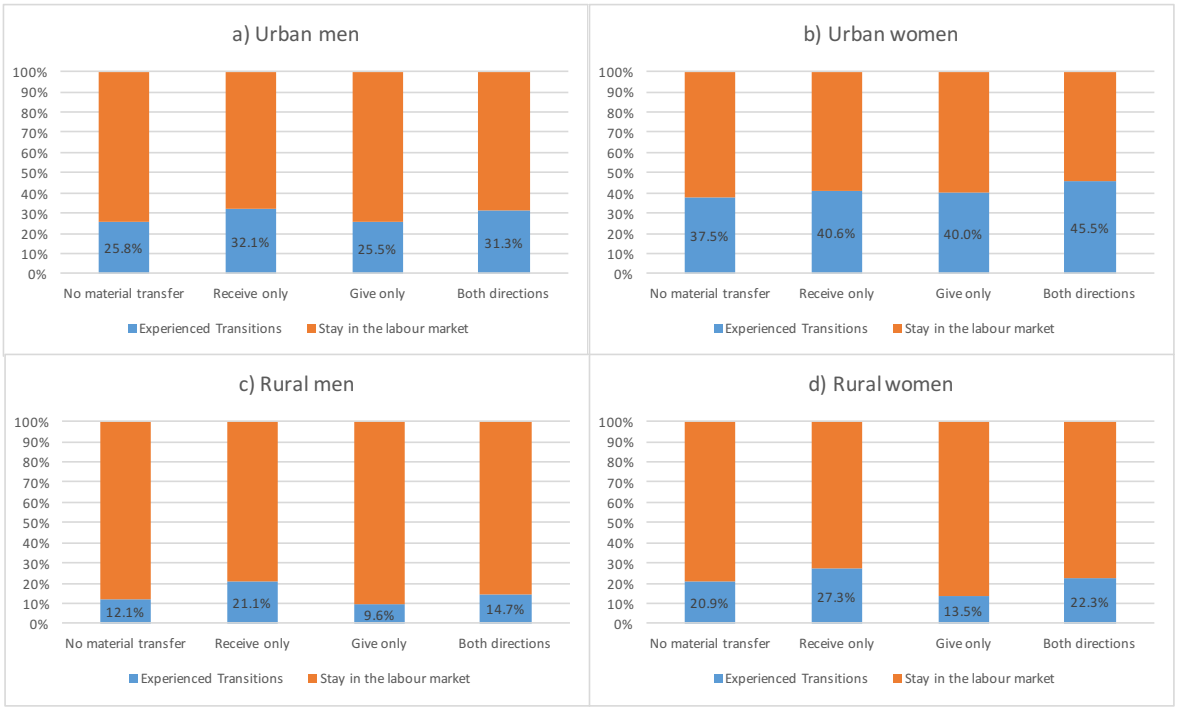
5.4.2 Intergenerational material transfers

Chapter 4 has shown that intergenerational material transfers can work as a supplementary income source (or additional household expenditure) for older adults, which is associated with a lower (or higher) probability of labour force participation. This section analyses the association between intergenerational transfers with other family members in 2011 and the transition into economically inactive status in the subsequent four years. Similar to Chapter 4, the downstream material transfers to children and the upstream material transfers to parents are discussed respectively. The focus of this section is the impact the material transfers as reported in 2011 on the labour market exit over the next four years. The changes in material transfers over the period are not investigated as the distribution of intergenerational transfer with children and parents in 2011 and 2015 is very similar (see Table A.4).

Figure 5.8 reflects the association between the transition into economically inactive status and the flow of material transfers between respondents and their children. The differences in the transition rates across groups are significant amongst rural residents. The net providers of material transfers have the lowest transition rates and the net recipients of material support have the highest transition rates. The transition rates of the 'no transfers' group and the 'transfers in both directions' group are moderate. Such a pattern also exists amongst urban men but is less clear amongst urban women. In terms of the material transfers with parents, it is similar that the net providers of material transfers experienced much lower transition rates than the groups with no material transfers (see Figure B.11).

These results show that intergenerational material transfers with family members are related to the labour market exit of older adults and the direction of support matters, which is in accordance with the observed associations in Section 4.4.2. The material support *from* other family members can works as an additional income resource and facilitate labour market exit, whilst the support *to* other family members can work as financial commitments and keep the respondents in the labour market.

Figure 5.8 Transition into economically inactive status by material transfers with children in 2011 (Sample B)



Note: The Chi-square tests are significant for all subgroups at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

5.4.3 Care provision to family members

Chapter 4 has shown that the care provision to grandchildren and parents has important but slightly different meanings concerning the labour force participation of older adults. The current section analyses whether the care obligations to family members make an impact on labour market exit.

The first focus of this section is the changes in the care provision to grandchildren over the period. According to Table 5.4, the proportions of new carers (without care provision in 2011 and with care provision in 2015) and those who stopped providing care provision are similar. Further results in Table A.4 show that the overall intensity of care provision to grandchildren has increased; for example, the proportion of respondents providing more than 20 hours caring hours per week amongst urban women increased from 15.8 to 26.3.

In terms of the association between care provision to grandchildren and labour market exit, the indicator of the changes concerning the care provision to grandchildren over the four years is not associated with the transition rates (Figure 5.9). This is different from the assumptions based on the role conflict theory and the results in Chapter 4. It is likely that since the four-year period is a relatively short period compared to the entire working lives, the care provision to grandchildren

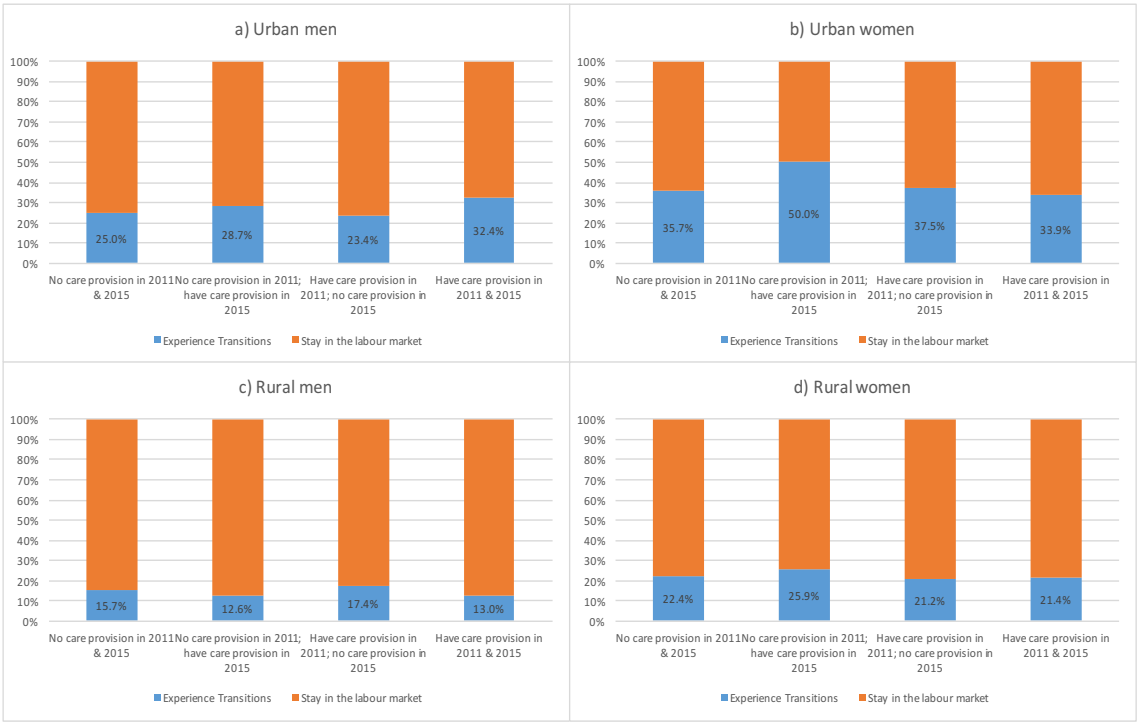
only has an impact on the work intensity of older adults rather than the decision to enter or leave the labour market. Their associations are further tested by multivariate analysis in Chapters 7 and 8.

Table 5.4 Changes in the care provision to grandchildren over from 2011 to 2015 (Sample B)

	Urban men	Urban women	Rural men	Rural women
No care provision in 2011 & 2015	54.5	57.3	47.8	41.2
No care provision in 2011, care provision in 2015	19.1	19.3	17.6	22.4
Have care provision in 2011 & 2015	10.0	7.0	14.0	11.7
Care provision in 2011, No care provision in 2015	16.4	16.4	20.6	24.7
Total	100.0	100.0	100.0	100.0
Valid N	639	342	4,191	4,127

Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Figure 5.9 Transition into economically inactive status by care provision to grandchildren (Sample B)



Note: Chi-square tests are not significant for all subgroups at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

The other research focus of this section is the impact of care provision to older parents on labour market exit. Unfortunately, the information on the care provision to parents in 2015 was not available in the CHARLS for unknown reasons. The indicator of 'having any surviving parents' is used as an alternative measurement of the changes in the care provision to parents over the four years. This alternative indicator is not fully comparable to knowing the actual caring hours. However, given that the respondents were aged 45 and over at baseline, it is likely that most of

the surviving parents in the study samples were very likely be of an advanced age and who were of an advanced aged and likely to be in need of certain care provision from their family members.

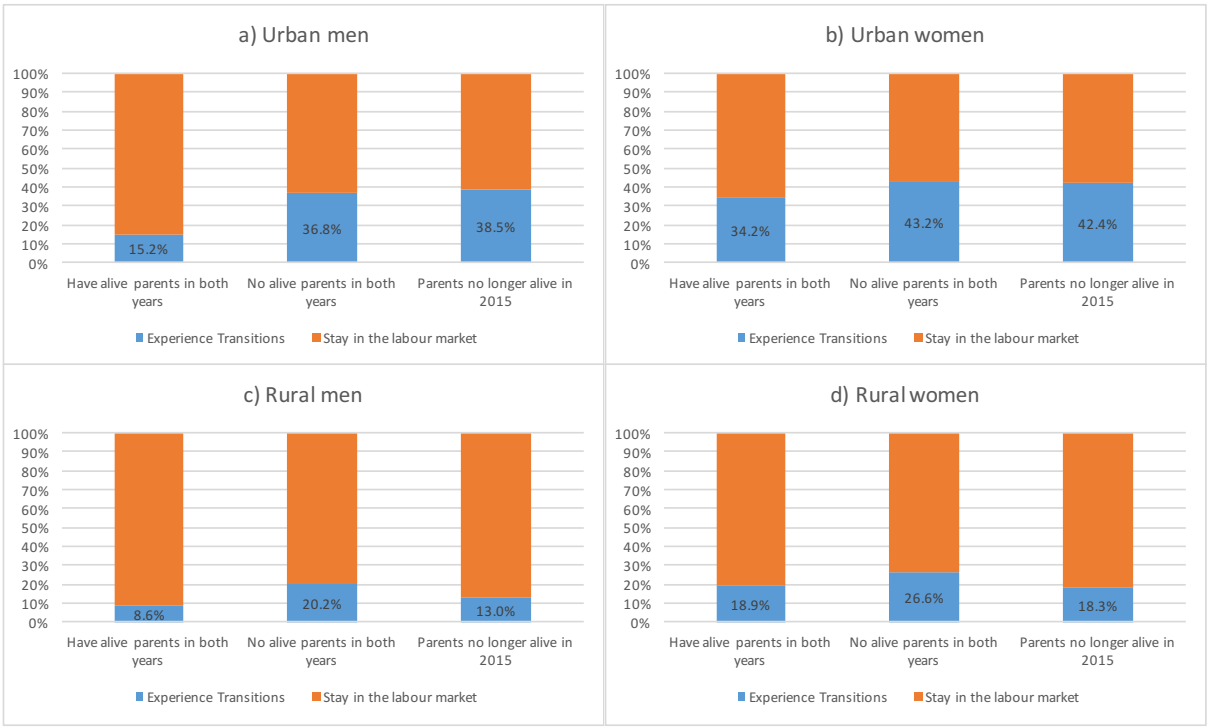
According to Table 5.5, there is a slight decline in the care provision to parents, which is reflected by the lower proportion of respondents surviving parents. In terms of the association between labour market exit and the care provision to parents, Figure 5.10 shows that those with surviving parents until 2015 experienced the lowest transition rates and those without any surviving parents since 2011 experienced the highest transition rates. These results indicate that the care obligations to parents are related to a higher probability of staying in the labour market. In consistent with findings in Chapter 4, it appears that the interactions with parents indicate the financial commitments to parents for older adults rather than the care obligations per se. However, these results may be associated with the age effect as well, as only those relatively younger respondents still have surviving parents.

Table 5.5 Changes in the care provision to parents from 2011 to 2015 (Sample B)

	Urban men	Urban women	Rural men	Rural women
Alive parents in 2011	57.4	63.5	50.9	48.5
Alive parents in 2015	50.6	56.4	41.2	38.8
	639	342	4194	4127

Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Figure 5.10 Transition into economically inactive status by care provision to parents (Sample B)



Note: The Chi-square tests are significant for urban men, rural men and rural women at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

5.5 Chapter summary

As the second empirical chapter of this thesis, this chapter presents descriptive results on the patterns of the transition into economically inactive status over the four-year period from 2011 to 2015. On the one hand, this chapter provides us with a further understanding of the dynamics of labour force participation, where the heterogeneity between living areas and gender are illustrated. On the other hand, this chapter also provides insights into the associations between key individual and family characteristics and labour market outcomes. Together with information in Chapter 4, these results work as a guide for further multivariate analysis of the correlates and predictors of labour market behaviour in later life in Chapters 7 and 8.

In terms of the the transition into economically inactive status, results in this chapter add further insights into the inequalities in the labour market building on the information in Chapter 4. Rural residents are more likely to work across all age groups and less likely to leave once they were in the labour market. Rural residents experienced higher transition rates with the increase of age. For urban residents, while the age effect is significant as well, the transition rates reach a peak around the SPA of the OPP. The results here indicate that the labour market behaviour of urban residents are largely shaped by the public pension policies. The larger gender differences amongst urban residents (compared to rural residents) also support the fact that the public pension system shapes the labour market behaviour of older adults strongly. Urban women experienced higher transition rates than urban men across all age groups. In addition, the differences in transition rates are the largest for the 45-49 and 50-54 age groups, which indicate the impact of differentiated SPA on men and women. In contrast, differences amongst rural residents are minor. These results are largely consistent with Chapter 4.

In terms of economic activities, non-agricultural workers experienced higher transition rates than agricultural workers; this is consistent to findings in Chapter 4 that as non-agricultural work is usually related to the formal sector and the access to pension benefits.

In terms of work intensity, the transition rates do not differ by the work intensity in 2011. Besides, those staying in the labour market did not experience much decrease in working hours over the four years. These results indicate that gradual or phased retirement, which features reduced working hours in the previous work positions or another one or adjustment of work before leaving the labour market, remains uncommon in the Chinese context. Instead, most labourers experience one-time exit from the previous work positions regardless of the previous work intensity. Whether this is the case is further tested in Chapter 6. More importantly, the high proportion of leaving the labour market around the SPA raises concerns on the extent to which

labour market exit at the SPA is involuntary, and points to the lack of flexible retirement policies that fully support older people's will to stay in the labour market.

Apart from the patterns of labour market exit, this chapter also provides evidence on the association between individual and family characteristics and the labour market exit in later life. The bivariate analysis in this chapter basically confirm the findings in Chapter 4, although the differences in labour market exit in relation to certain indicators become smaller.

Health status remains to be crucial for the labour market exit of rural residents but may not be so critical for urban residents. This is reflected by the fact that chronic illnesses remain to be important for the labour market decisions of rural residents but not urban residents, and the fact that all categories of the the prevalence of IADL difficulties are significant amongst rural residents but not urban residents. The results here indicate that health status might be less importance than other characteristics for the labour force decisions of urban residents over a short period (e.g. the receipt of pension benefits).

Regarding the importance of SES, the associations between SES indicators and transition rates are only significant amongst rural residents, and SES is a less important correlates of labour force participation for urban residents. In general, different from the theories that more available financial resources are related to a lower propensity towards working, rural residents with lower SES are found to have higher transition rates. In consistent with the findings in Chapter 4, the meanings of these SES indicators are complicated and do not limit to financial status.

The receipt of the occupational pensions remains to be an important factor that is related to the transition rates. Individuals who were recipients in 2011 and those started to receive benefits during the period are related to higher transition rates. These results mean that the available financial resources (pension benefits) are an important pull factor that provides incentives of leaving the labour market for older adults.

In terms of marital status, variations in transition rates according to marital status remain to be large. The tendency towards joint retirement of couples is observed as well.

In terms of the material transfers with family members, results in Chapters 4 and 5 are highly consistent with each other. The material support *from* either children or parents work as additional income source and is related to higher transition rates. in contrast, the material support *to* family members can work as financial commitments and additional expenditure, which is related to lower transition rates.

The impact of care provision to grandchildren appears to be smaller compared to results in Chapter 4. The results echo some studies which only found a negative impact on working hours rather than the decision to leave the labour market (Johnson and Lo Sasso, 2000; Casado-Marín, García-Gómez and López-Nicolás, 2011; Meng, 2013). On the other hand, having surviving parents (the alternative indicator of care provision to parents) is related to a lower probability of the transition into economically inactive status. The results again indicate the different meanings of the care provision to grandchildren and parents. However, the bivariate analysis may be affected by the age effect and needs further multivariate analysis.

Combining information in Chapters 4 and 5 together, the associations between family characteristics and labour market behaviour indicate the heavy burden that older adults may undertake due to their intense material and time transfers to other family members. A large number of middle-aged and older adults are in pivotal family positions and have time transfers to support different generations at the same time. These results are consistent with findings in both domestic and international literature that an increasing number of mid-life adults raise dependent children and care for frail elderly parents simultaneously (Seaward, 1999; Grundy and Henretta, 2006; Pierret, 2006; Falkingham *et al.*, 2019). Moreover, having informal care provision and full-time work at the same time can lead to lower well-being in later life (such as poor health status) (Schmitz and Stroka, 2013), which is especially the case for older females as they are more likely to be caregivers. These potential associations are investigated in Chapter 7 and 8 using multivariate analysis.

Chapter 6 Results III: Work histories of older adults in China

6.1 Overview

In order to fully understand the patterns of the labour market behaviour of older adults in China, Chapters 4 and 5 have provided evidence on labour force participation at a specific time point and the transition into being economically inactive over a period respectively. This chapter analyses the work trajectories of older adults. Compared to Chapters 4 and 5, this chapter focuses on the timing and the order of different economic activity states (and work intensity) over the working lives. Specifically, this chapter addresses RQ3: *What are the work history patterns of older adults in China and how do these vary across different social groups?*

The results in this chapter contribute to the existing studies on the labour market behaviour of older adults in the Chinese context, most of which are limited to a single time point or a short time period (see Section 2.5). To the best of our knowledge, this is the first time that the work histories of current older adults have been explored. More importantly, this chapter reflects the changes in the working lives of individuals across cohorts and how they are shaped by the transformations within the economic and institutional background. The cohort comparison not only depicts the labour market situation in the past and present but also helps to predict the potential trend of the labour market behaviour in the years to come. The results presented here provide important evidence to inform future policy designs aimed at reducing inequalities in later life. The third aspect of contribution of this chapter to the existing literature is the link between work trajectories and key individual and family factors, indicating the impact of ascribed status and early experiences that are accumulated and that continue over the life course. These results provide insights into the factors influencing the labour market behaviour in later life in this thesis as well as for research in the future.

Sample C was employed for analysis in this chapter (N= 7,813). The observation period is set from age 25 to 60 (age 25 to 55 for urban women) to reflect the impact of public pension programmes (and the SPA) on labour market behaviour[15]. Thus, the minimum age of respondents in Sample C is 60 (55 for urban women), which is different from Samples A and B (age 45).

[15] The work histories from 25 to 65 (60 for urban women) are also investigated (see Figure B.12); they basically reflect similar information as the discussions in the main text.

This chapter is arranged as follows. Section 6.2 presents the work trajectories of respondents aged 60 and over (55 and over for urban women), with a focus on the differences in work trajectories between living areas and genders. Section 6.3 discusses the details of work trajectories by analysing the typology of each subgroup; in addition, the association between work trajectories and ascribed status in early life, and their accumulated impact of work trajectories over the life course are revealed. Section 6.4 illustrates the cohort differences in labour market behaviour and discusses the impact of societal context on shaping the cohort differences. Section 6.5 summarises the main findings concerning the work histories of older adults in China in this chapter, which are also relevant to the association between typical work trajectories and labour market behaviour in later life, which are further discussed Sections 7.4 and 8.4.

6.2 Urban-rural differences and gender differences in work histories

This section investigates the heterogeneity in work histories between urban and rural residents and between men and women. The author analyses urban-rural differences first and then look at the gender differences within each living area. Figures 6.1 and 6.2 present the work trajectories of older adults who were 60 years and over in terms of economic activity states and work intensity. In terms of urban-rural differences, three key aspects stand out. Firstly, there are differences in the proportions engaged in different types of **economic activity states** over the life course, reflecting the different structures of the urban and rural labour markets. The dominating state amongst urban residents (for both men and women) is "employment without *Bianzhi*", followed by "employment with *Bianzhi*" (Figure 6.1). Both states are related to the formal sector. In contrast, the dominating state amongst rural residents is long-term agricultural work, including household agricultural activities and agricultural employment. Such difference over the life course reflects the division of the economic structure and the labour market between living areas, which has been the case since several decades ago and still continues at present (see Section 1.3). Rural areas are less developed in terms of the process of industrialisation, and the majority of rural residents are restricted to household agricultural activities which usually provide lower economic rewards. Only a small number of pioneers amongst current older rural residents have ever been involved in non-agricultural employment, and their attachment to long-term or permanent working positions in the formal sector is weak or temporary.

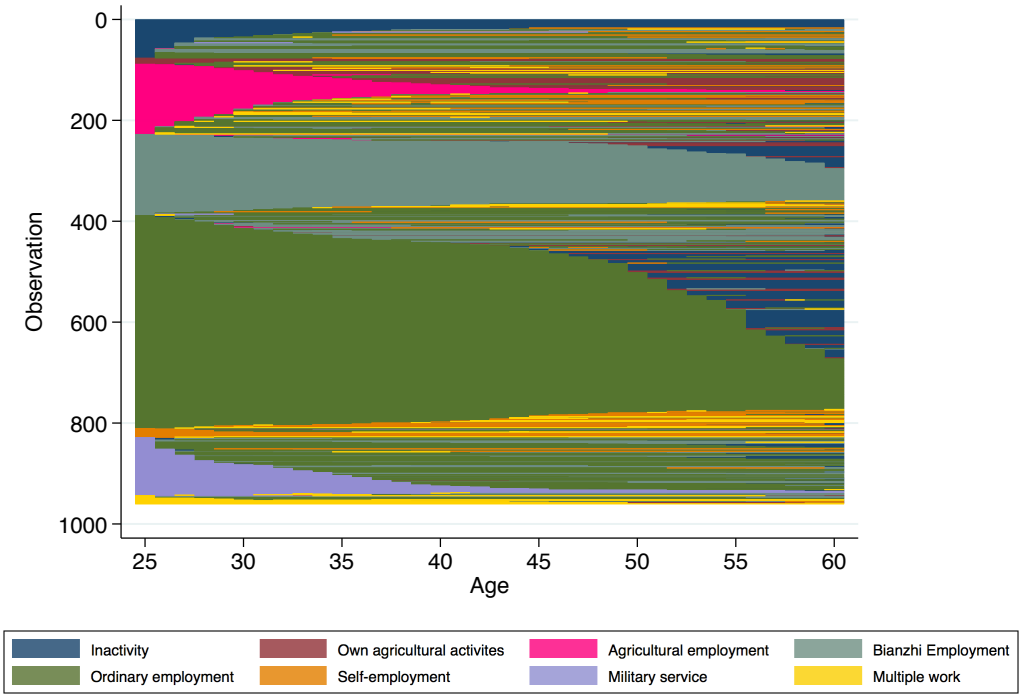
Secondly, **the timing of leaving the labour market** varies between living areas. The data highlight a substantial decrease in the labour force participation of urban men after age 50 and urban women after age 45, whereas the overall level labour force participation of rural residents remains relatively stable across the working life (from ages 20 to 60) (Figure 6.1). Considering that

urban employees are the major participants of the Occupational Pension Programme and that the lowest threshold for claiming pension benefits is age 50 for men (and age 45 for women), the decline in labour force participation in mid-life is very likely to be related to the SPA. For individuals, the calculation method of pension benefits may not provide enough financial incentives for them to stay in the labour market after the SPA. The 'Lay-off Wave' that occurred during the restructuring of SOEs in the 1990s may also have resulted in involuntary early exit from the labour market for some urban workers (see Section 1.3). In contrast, most rural residents are not eligible for the OPP as they have never been members of the formal sector. The Residents' Social Pension Programme, despite having achieved a wide coverage in rural areas, only provides a very basic level of pension benefits at present (see Section 1.3). Thus, residents in rural areas may not have sufficient financial resources to support their old age and need to work continuously to advanced ages.

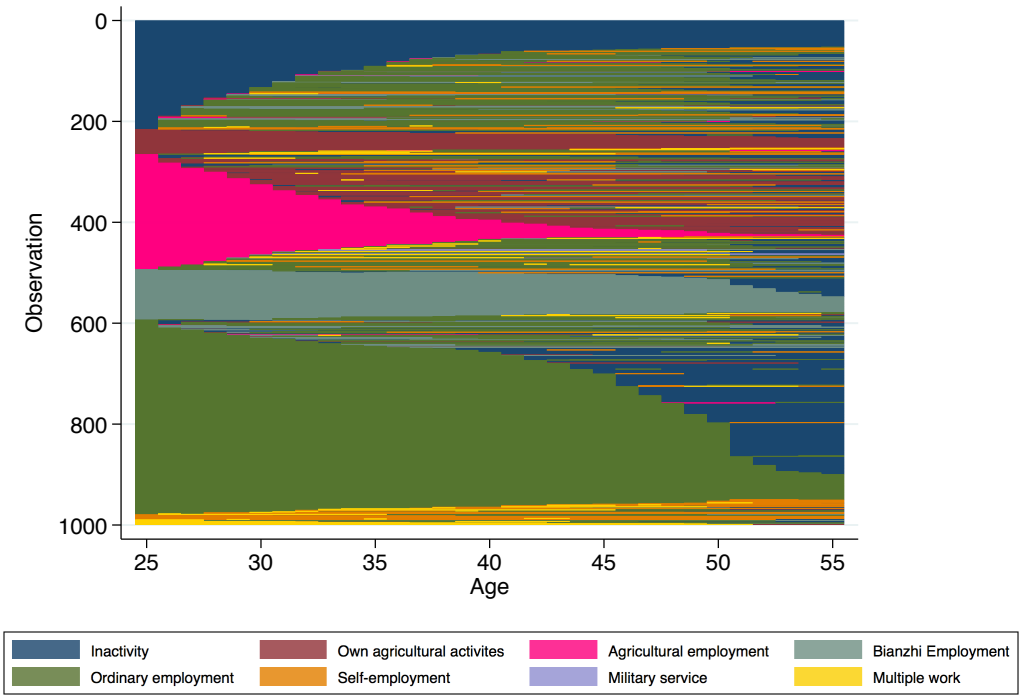
Thirdly, there are noticeable differences in **work intensity** between urban and rural residents. Urban residents mainly engaged in full-time work over the life course; the proportion of part-time work over the life course is low and stable (Figure 6.2). Since employment is the dominant economic activity state for the majority of urban residents, their working patterns are less flexible in terms of working hours. By contrast, there is a higher proportion of engagement in part-time work across the working lives of rural residents (Figure 6.2). There are many transitions from full-time to part-time work in the working lives of rural residents, which can happen at any time during the period from ages 30 to 60 (Figure 6.2). These transitions in work intensity in part reflect the dissolution of collective agriculture in the late 1970s, after which household agricultural activities, with higher flexibility, become the main form of economic activity amongst rural residents (see Section 1.3). Financial necessity may provide another important reason for residents to work intensively, especially in rural areas.

Figure 6.1 Economic activity states by living area and gender (from ages 25 to 55 for urban women, from ages 25 to 60 for other groups)

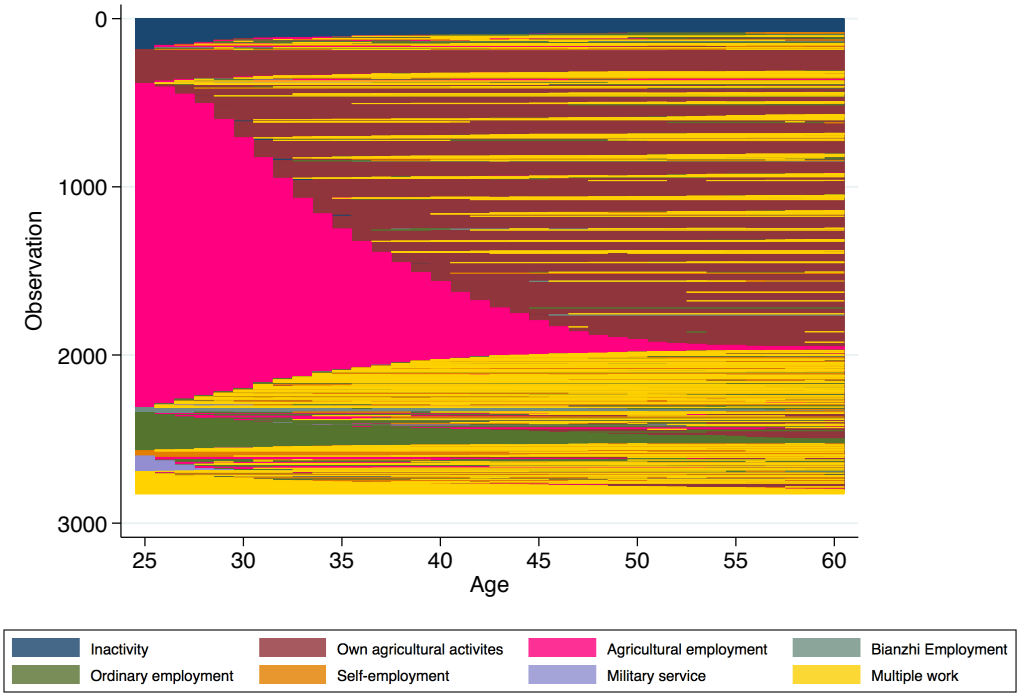
a) Urban men (N=960)



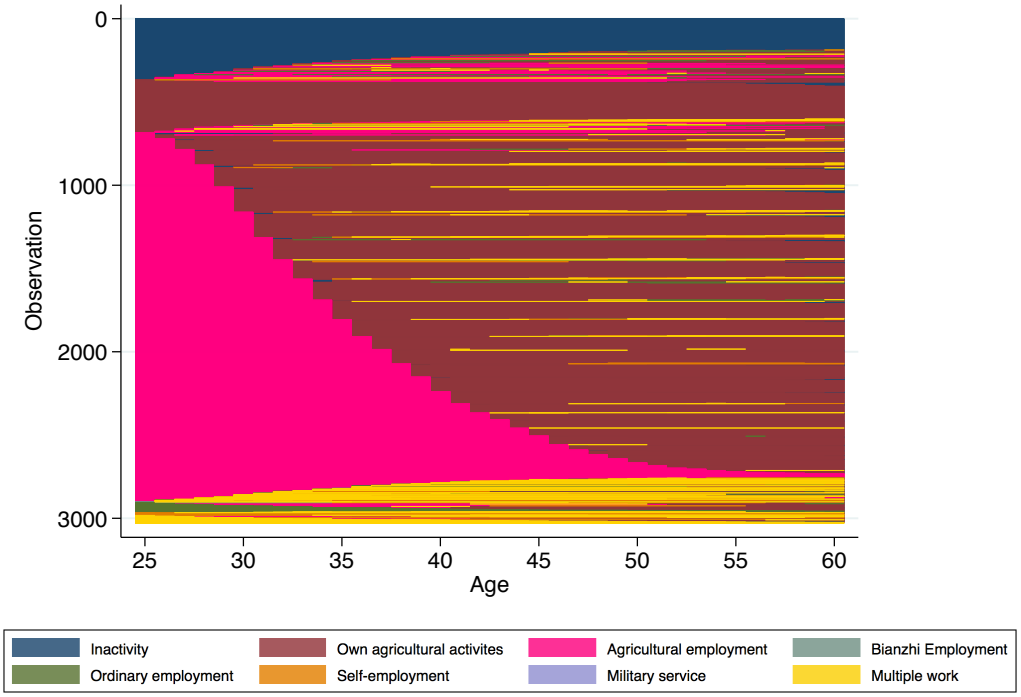
b) Urban women (N=999)



c) Rural men (N=2,825)



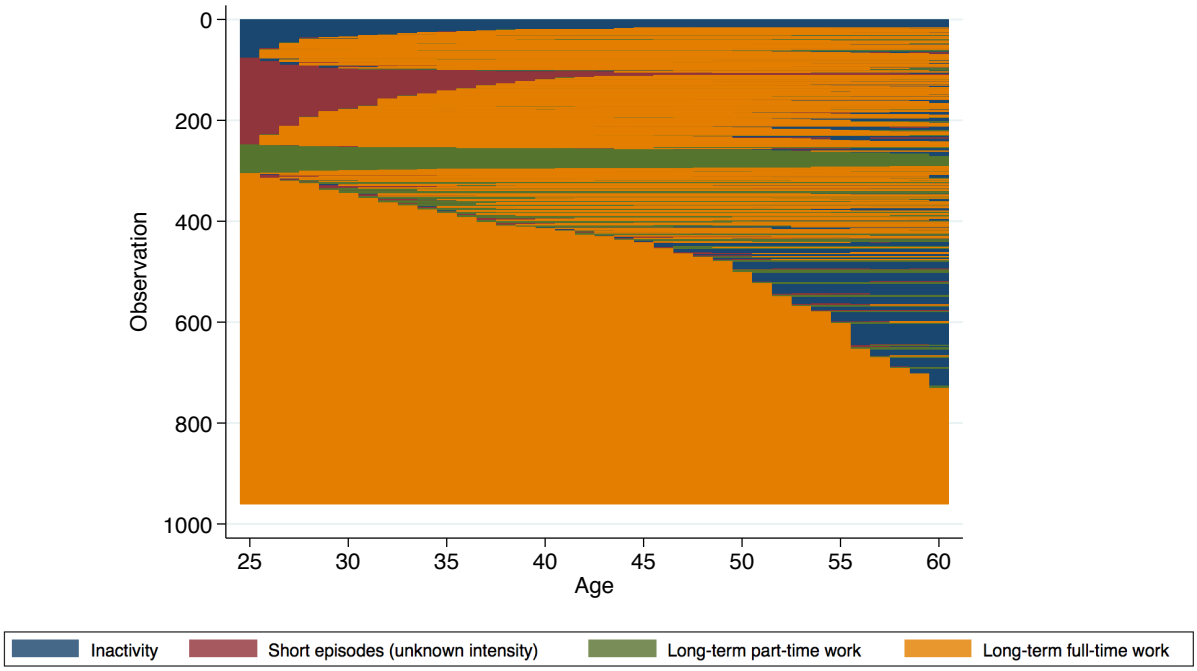
d) Rural women (N=3,029)



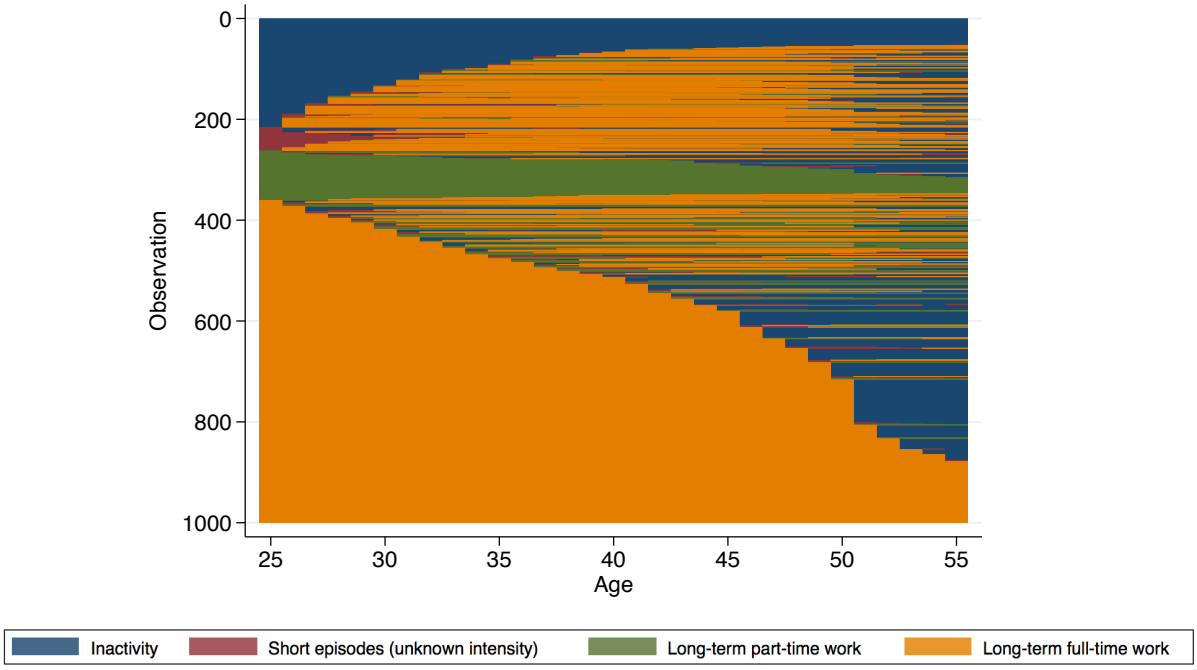
Source: Author's own analysis using data from the CHARLS Life History Wave (2014).

Figure 6.2 Work intensity by living area and gender (from ages 25 to 55 for urban women, from ages 25 to 60 for other groups)

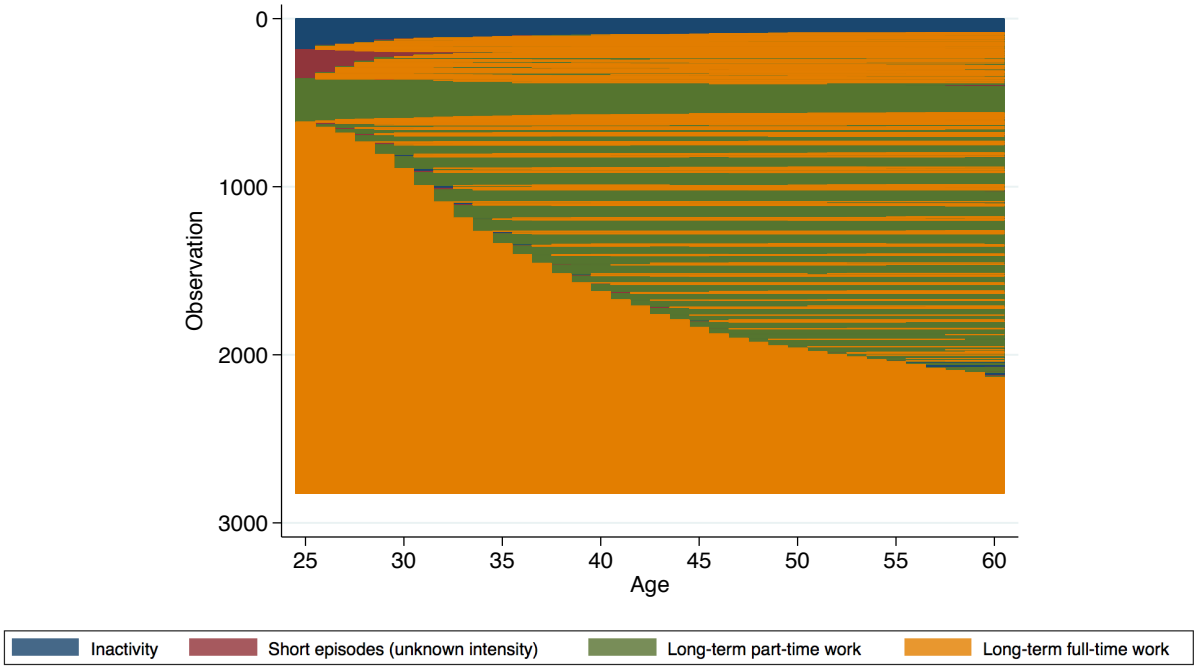
a) Urban men (N=960)



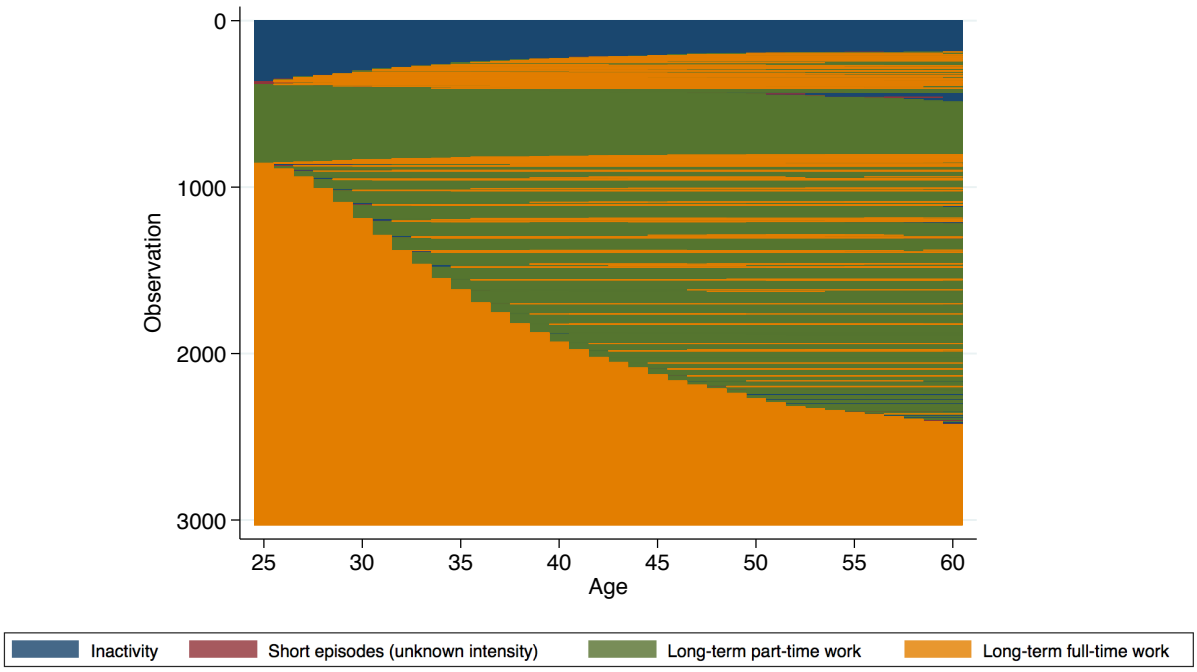
b) Urban women (N=999)



c) Rural men (N=2,825)



d) Rural women (N=3,029)



Source: Author's own analysis using data from the CHARLS Life History Wave (2014).

Generally speaking, the gender differences in work histories are less striking than the urban-rural ones. Both men and women experienced intensive full-time work in their prime working ages, which is the case for either living area (Figures 6.1 and 6.2). The prevalence of the dual-earner family and women's full-time working pattern confirms that the egalitarian gender ideology which was developed by the early Communist government in the 1950s has persisted until recently (Pimentel, 2006).

Yet there are differences in terms of work histories between men and women. Firstly, in terms of **inactivity**, older urban women had fewer working years on average than older urban men. On the one hand, urban women were more likely to be economically inactive at the beginning of their career lives. For urban men, the unstable early period with a relatively high proportion of inactivity only lasted for about 5 years; the unstable early period for urban women is much longer, ranging from ages 20 to 35 (Figure 6.1). Urban women's fewer working years in their early life stage may result from time spent in child-bearing and child-rearing and the conflict between such obligations and full-time work. On the other hand, urban women also experienced longer economically inactive periods at the end of their career lives than urban men. The significant decline in labour force participation at around age 50 amongst urban men started but started at around age 45 amongst urban women (Figure 6.1). The fewer working years of urban women in their later years are due to the gendered retirement policies concerning the SPA, where women are eligible for pension benefits 5 to 10 years earlier than men (see Section 1.3). It is notable that the gender differences in terms of inactivity are only observed amongst urban residents. Rural women worked intensively until advanced ages and experienced much fewer inactive periods than urban women (Figure 6.1). This is because rural women are less likely to have an attachment to the formal sector and be affected by the relevant labour market and pension policies in late years.

Secondly, in terms of **economic activity states**, the work experience of men appears to have been more diverse than women in both living areas. In urban areas, men were more likely to obtain the 'Employment with *Bianzhi*' status than women, which in turn is related to higher salaries and pension benefits (Figure 6.1). In rural areas, men were more likely to engage in employment than women (Figure 6.1). Rural men were more likely to have multiple jobs at the same time as well, reflecting a higher propensity to work as migrant workers in industrial or tertiary sectors (Figure 6.1). In this sense, older women (from both living areas) appear to have been disadvantaged in the labour market during their working lives, not only in terms of work opportunities and financial gains but also with respect to the opportunities for self-development which work can offer; these disadvantages can lead to poorer financial well-being in later life.

6.3 Typology of work histories: unravelling social heterogeneity within subgroups

This chapter has so far summarised the heterogeneity by examining the overall work histories of the older population. This section makes further analysis on the work history within each subgroup by developing a set of specific work history typologies. The work typologies provide further information on the social heterogeneity within work history. On the other hand, the association between work histories and individual characteristics in early years are shown, which shed light on the understanding of the pathways to the labour market outcomes in later life.

Figure 6.3 shows the typology of work histories within each subgroup. For each group, the results of cluster analysis are shown. The size of each figure reflects the the number of case in each cluster (the specific proportion of each cluster can be found in Table A.16). Each identified typical work trajectory is named with the common work trajectories within that cluster.

6.3.1 Typology of the work histories of urban men and women

The work pathways of urban men are classified into nine types (Figure 6.3). The nine types can be classified into three groups in terms of the dominant economic activities: ordinary employment (Types 7 to 9), *Bianzhi* employment (Types 5 and 6) and other economic activity status (Types 1 to 4).

Ordinary employment is the most common economic activity. Respondents with the work trajectory of 'Type 7 Long-term ordinary employment' account for the largest group (44.7%). In terms of the timing of leaving the labour market, the proportion of being economically inactive starts to increase from age 45 and continues until the end of the observation period (age 60). A moderate number of respondents worked until age 60 and leaving the labour market, but many respondents continued to work afterwards (see Figure B.12).

Other trajectories dominated by ordinary employment include 'Type 8 Ordinary employment with other early experiences' and 'Type 9 Mid-life transformations', which describe the mixed working experiences of ordinary employment and other economic activities over the life course. The work trajectory of Type 8 represents the respondents who had military experience or agricultural employment in early years prior to their later long-term ordinary employment. 'Type 9 Mid-life transformations' represents the individuals who left their ordinary employment positions in middle age and transferred to self-employment (or own agricultural activities) afterwards. It is likely to represent the work trajectories of respondents who became Lay-off workers in the 1990s. During the Lay-off Wave, opportunities of *Bianzhi* employment reduced greatly, and lots of

employees had to find another jobs or even forced to proceed to disability retirement (see Section 1.3). Given this group contains a higher proportion of respondents aged 60-64 (see Table A.9), whose middle years correspond to the timing of the Lay-off Wave, , this is likely to be the case. Besides that, it is notable that a much higher proportion of respondents with the work trajectories of Types 8 and 9 had been working from ages 25 to 60 compared to respondents with long-term ordinary employment (Type 7). These results indicate that early experiences and interruptions of work may lead to longer stay in the labour market.

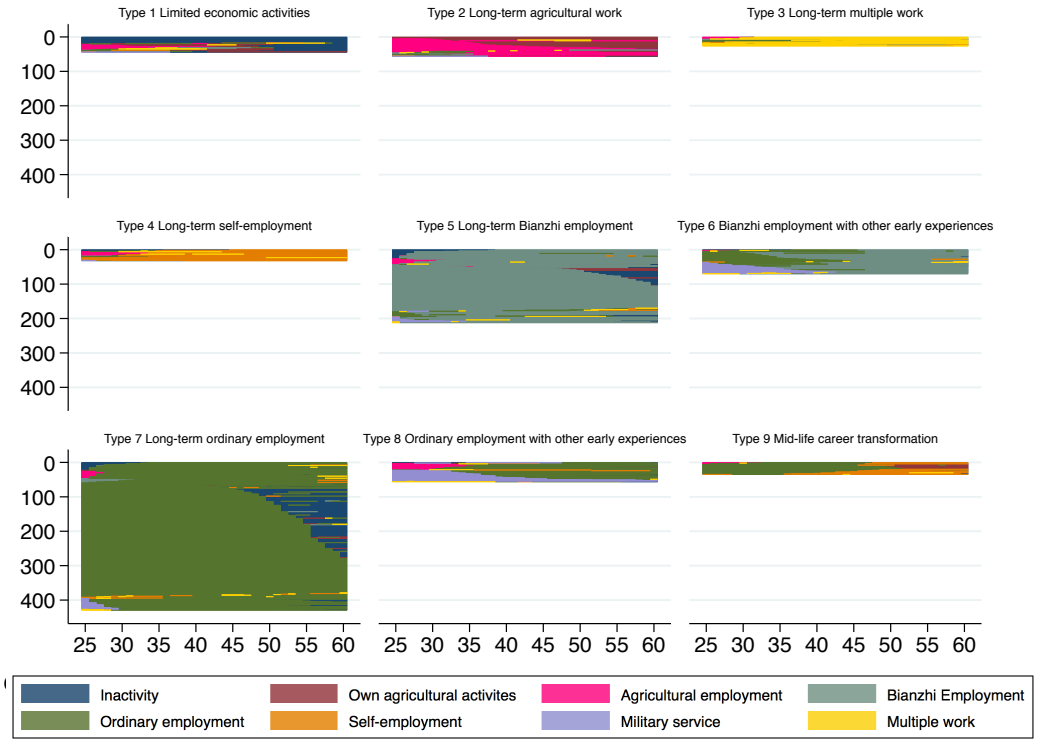
Bianzhi employment is another important economic activity, which accounts for a slightly smaller proportion than ordinary employment. The two relevant work trajectories are 'Type 5 Long-term *Bianzhi* employment' and 'Type 6 *Bianzhi* employment with other early experiences'.

Type 5 represents the respondents who worked until age 50 and left the labour market during the period from ages 50 to 60. About 75% respondents of this group were still in the labour market at age 60. Type 6 represents the respondents who had military or agricultural employment work experiences before the ordinary employment. Again, these early experiences seem to be associated with late labour market exit, as a higher proportion of respondents with the work trajectories of Type 6 worked until age 60 than respondents with the work trajectories of Type 5.

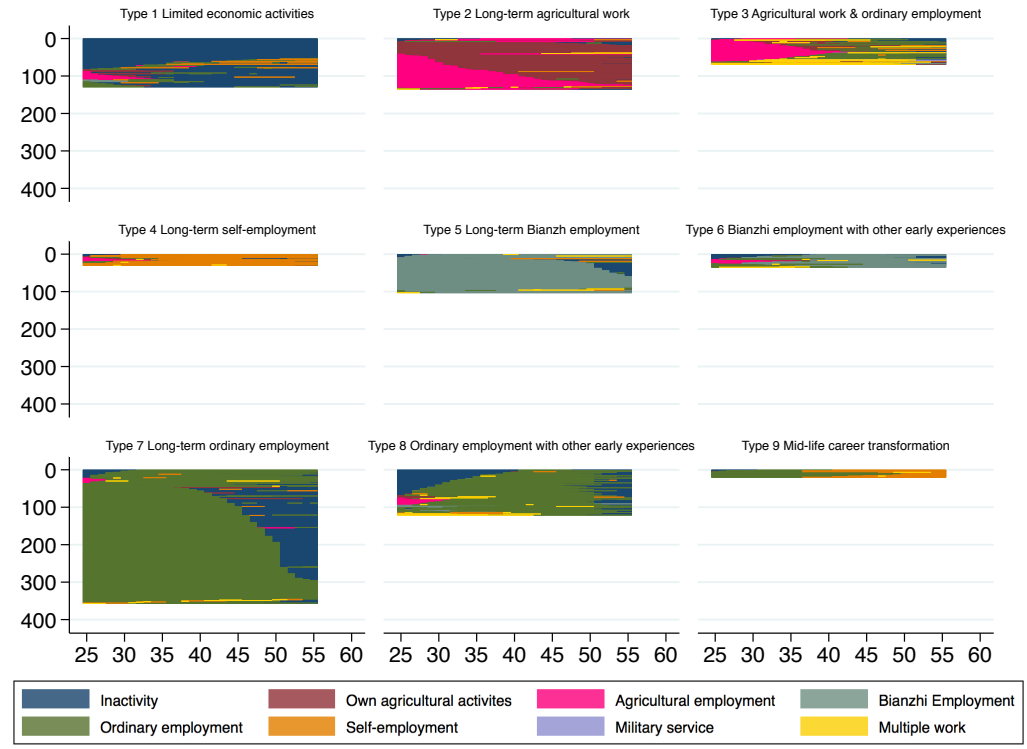
The work trajectories of Types 1 to 4 are related to economic activity are related to the informal sector, which are less common amongst urban residents. 'Type 1 Limited economic activities' represents respondents with few working years and limited economic activities over the life. However, this group is quite heterogeneous – a small number of respondents of this group have more working years spent in agriculture. Types 2 to 4 represent the work experiences of long-term agricultural work, long-term multiple jobs and long-term self-employment respectively. The absolute majority of respondents with the work trajectories of Types 2 to 4 worked until the end of the observation period – which indicates that these work experiences in the informal sectors are related to a higher probability of working in advanced ages.

Figure 6.3 Trajectories of economic activity status from ages 25 to 60 by cluster membership (age 25 to 55 for urban women)

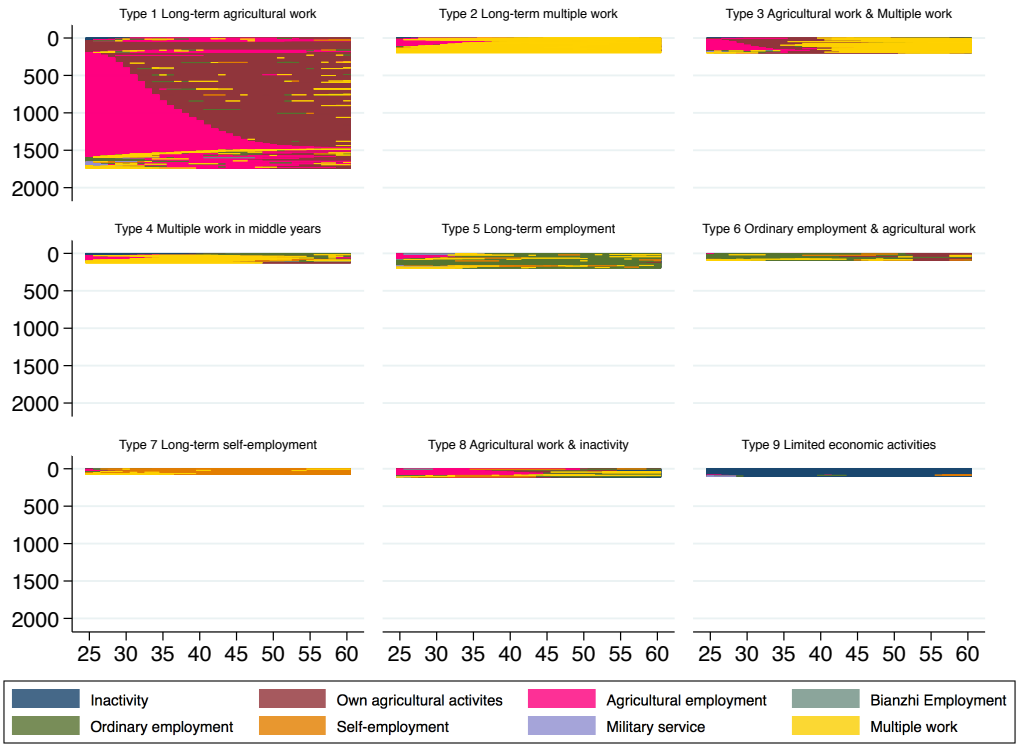
a) Urban men (N=960)



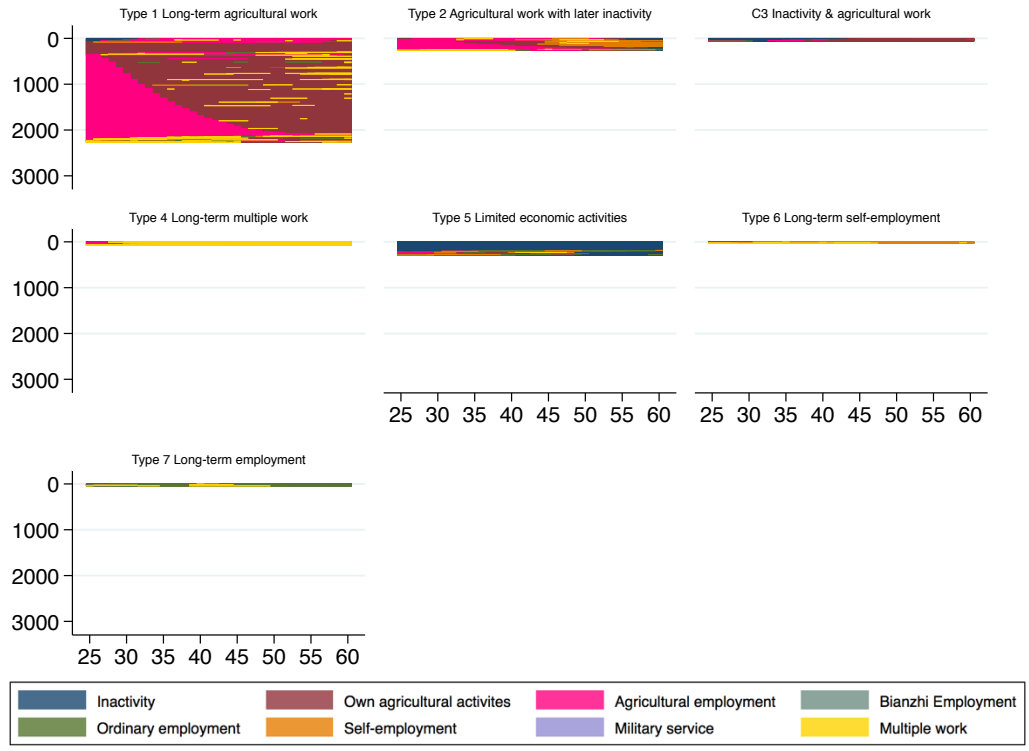
b) Urban women (N=999)



c) Rural men (N=2,825)



d) Rural women (N=3,029)



Source: Author's own analysis using the CHARLS 2014 Life History Wave.

The work trajectories of urban women are classified into nine types (see Figure 6.3). The work typology of urban women is quite similar to that of urban men; the nine types can be grouped into three subgroups, which are dominated by ordinary employment (Types 7 to 9), *Bianzhi* employment (Types 5 and 6) and other economic activity status (Types 1 to 4).

Similar to the experiences of urban men, ordinary employment is the most common economic activity. Respondents with the work trajectories of 'Type 7 long-term ordinary employment' have been working for the majority working lives. The inactivity of this group began to increase as early as age 40 and has continued steadily until age 55. Age 50 witnessed a significant drop in labour force participation as well, which corresponds to the SPA of female staff. Respondents with the work trajectories of Type 8 had early work experiences before their long-term ordinary employment, which is mainly inactivity and agricultural employment. It is notable that the early experiences of these respondents include a small proportion of inactivity which is not found in the group of urban men with long-term experiences. In addition, it appears the proportion of those left the labour market at 50 and those worked until the end of the observation period are similar. This leaves the question on whether there is an association between early experiences and late exit, just as urban men shown in Type 8 remained unclear and needs to to tested. Respondents with the work trajectories of 'Type 9 Mid-life career transformation' have similar work experiences as urban men - they turned to self-employment or agriculture after a relatively long-period of employment. The absolute majority of this group left the labour market at age 55. Similar to the experiences of urban men, urban women with interruptions of work histories are more likely to experience late labour market exit than their counterparts.

The major work experiences of respondents with the work trajectories of Types 1 to 4 are related to the informal sector. 'Type 1 Limited economic activities' represents respondents who have limited working years. This group is heterogeneous and some respondents have agriculture employment in early later years. Types 2 and 4 are dominated by agricultural work and self-employment respectively. 'Type 3 Agricultural work & ordinary employment' represents the working lives of agricultural employment in early years and multiple jobs (or employment) in later years. Notably, almost all respondents with the work trajectories of Types 2 to 4 worked until age 55. Again, it seems that work experiences in the less formal sector are related to longer working years in the labour market.

The details of work typology within each subgroup confirm the gender differences observed in Section 6.2, that urban women experienced more transitions in terms of moving in and out of economic inactivity, but fewer variations in terms of the types of economic activities. More than twenty percent of urban women have experienced long inactive periods over the observation

period (Types 4 and 7), whereas long-term inactivity is uncommon amongst urban men (Type 1, which makes up less than 4% of respondents). On the other hand, the work histories of urban women are more homogeneous since there are no separate clusters for multiple jobs at the same time and self-employment as is the case for urban men.

An additional finding when examining the typologies of work histories of urban residents is that the dominant work states over the life course and **early work experiences** are related to each other. This is more evident amongst urban residents, as the work pathways of rural residents are less complicated and contain fewer early experiences. For urban men, long-term employment, either with or without *Bianzhi* (Types 5 to 9 in Figure 3), is related to early experiences in the formal sector; conversely, long-term employment is not likely to be related to self-employment or agricultural activities. For urban women, it is very unlikely for those who experienced long-term employment with *Bianzhi* (Type 5) to have had any other early experiences, especially agricultural work, compared to those having long-term employment without *Bianzhi* (Type 3). These associations indicate that involvement in the formal sector is linked to early life experiences. Those who were already members of the *Bianzhi* system at the beginning of their working lives tended to stay within the system for a long time, while those who were not members lacked the opportunities to enter the system.

6.3.2 Typology of the work histories of rural men and women

Compared to urban residents, the work experiences of rural residents are more homogeneous. Most of them did not experience many differences in economic activity states and worked until age 60 without intervals. Their labour market behaviour is more similar to each other than their urban counterparts. The work trajectories of most clusters are relatively homogeneous, featuring one leading employment status over the working lives. There are several clusters dominated by agricultural work, containing different proportions of agricultural employment and own agricultural activities.

The work trajectories of rural men are classified into nine clusters (see Figure 6.3). Most of these clusters are closely related to agricultural work. Amongst them, 'Type 1 Long-term agricultural work' account for the largest proportion (61.5%). The respondents with the work trajectory of Type 1 experienced differences in the proportion of agricultural employment and own agricultural activities, which is related to their age and the relevant timing of social events in their career lives, such as the dissolution of agricultural operatives. The work trajectory of Type 8 is similar to Type 1 but those respondents became economically inactive in later life.

Types 2 to 4 are related to experiences of multiple jobs to a great extent. The period of the multiple jobs may continue over the life course (Type 2) or last for a few years (Types 3 and 4). Considering China's labour market structure, these respondents are very likely to be migrant workers who have agricultural and non-agricultural work at the same time.

Types 5 to 7 represent the work experiences in the formal sector. The work trajectory of 'Type 5 long-term employment' mainly contains ordinary employment episodes and *Bianzhi* employment is very rare. 'Type 6 Ordinary employment and employment work' represents the respondents who had employment in early years but had agricultural work in later life. Type 7 represents the respondents with long-term self-employment. These work trajectories account for a very small proportion of respondents in total. Lastly, Type 9 is related to respondents with limited economic activities over the life course.

The work trajectories of rural women are classified into seven clusters (see Figure 6.3). Similar to the work experiences of rural men, 'Type 1 long-term agricultural work' is the most typical work trajectory (75%). Type 2 and Type 3 are also related to agricultural work, but respondents of both types experienced several years of inactivity.

The work trajectories of Types 4 to 7 are related to non-agricultural work. Type 4 is related to long-term multiple jobs. Type 5 is related to respondents with limited activities over the life course. Type 6 and Type 7 are related to work experiences in the formal sector. The comparison between the work trajectories of rural men and women conveys that the labour market behaviour of older rural women is more differentiated in terms of inactivity but less distinct in terms of economic activities states. More than twenty percent of today's older rural women had long durations of inactivity during the observation period (Types 1, 5 and 7), but only less than 5% of older rural men experienced long-term inactivity (Type 11). Rural women were less likely to be employees, self-employed workers and have multiple jobs as there are no separate clusters for these economic activities states as is the case for rural men.

6.3.3 Personal characteristics and differentiated work histories

Next, the author investigates the differences in the personal characteristics of membership in the various clusters in an attempt to shed further light on the factors that may explain the social heterogeneity within work trajectories evident amongst current older people in China. Several indicators are used to measure personal characteristics[16], including age, educational attainment

[16] Two alternative indicators of family financial situations are used but neither of them reflects any association between family background and work trajectories (mother's educational levels and self-

(finishing middle school or higher educational attainment), father's educational attainment (any formal education), participation in the OPP, the number of children and age at first childbirth[17]. The results for each of these indicators are shown in Table A.8. Several features are of note.

Firstly, there is a clear link between **educational attainment** and cluster membership for both urban and rural men and women. Respondents with work experiences in the formal sector have higher educational attainment than the others. Taking urban men as an example (Table A.8), respondents with long-term *Bianzhi* employment have the highest educational levels (Type 5 and Type 6, 74.5% and 78.6% respectively) and respondents with long-term ordinary employment have moderate educational levels (Type 7 and Type 8, 55.0% and 58.9% respectively). Respondents with other work trajectories have lower educational attainment on average, especially Type 2 Long-term agricultural as only 12.5% respondents have finished middle school. Amongst urban women, the difference in educational attainment between clusters is smaller but still significant (Table A.8). For rural residents, again those clusters containing higher proportions of employment (either with or without *Bianzhi*) are related to higher educational levels (Table 6.1, Type 5 for rural men and Type 7 for rural women). Those only having agricultural work over the life course unlikely to have finished middle school and by extensions were more likely to be illiterate (Table A.16). These findings show the importance of human capital investment in shaping work trajectories. Higher educational achievement is more likely to lead to work opportunities that provide higher economic rewards and better social positions. For older urban residents, higher educational attainment can usually provide the qualifications for *Bianzhi* employment positions with *Bianzhi*; for older rural residents, the basic knowledge of reading and writing is usually a requirement for work opportunities in the formal sector.

Secondly, there is not a clear association between **family background** and work trajectories. The differences in father's educational attainment are not large in all groups, reflecting the fact that the parents of those currently aged 60 and over were educated themselves prior to the communist regime during the 1920s-1940s and thus literacy levels are generally low. The only exception is amongst urban women; those with a work history of long-term employment have a higher average level of father's education than the other groups. While family background has

evaluated family financial status). The age at first marriage is used as an indicator for family formation age and basically reflect similar information as the indicator of age at first childbirth. Results on the three indicators are not reported.

[17] Three alternative indicators of family background are used (whether father is a member of the Communist Party, mother's educational levels and self-rated family financial status during childhood) but none of them reflect any significant association between the family background the work trajectories. The age at first marriage is used as another indicator for family formation age and basically reflect the same information as the indicator of 'age at first marriage'. Results on these indicators are not reported.

been found to play an important role in determining work trajectories in western societies (Anyadike-Danes and McVicar, 2010), current older adults in China were more likely to be impacted upon by changes in work and social positions in their own, rather than their parent's, lives.

Thirdly, there is a strong link between **family characteristics** and work trajectories amongst urban residents, but not amongst rural residents. In general, urban employees in the formal sector tend to have fewer children and to have postponed the start of family formation than other groups. For urban men, respondents with long-term employment had fewer children and higher ages at first childbirth (Types 6 to 9), compared with long-term agricultural workers and the self-employed (Types 2 to 4). These respondents may have spent more time in education and also have given a higher priority to work than family formation. However, respondents having long-term employment with *Bianzhi* (Type 5) appear to have a higher mean number of children and an earlier family formation age, which reflects an opposite association. For older urban women, the association between family formation age and work trajectories is stronger. Urban residents with long-term agricultural work have the highest number of children and the lowest age at first childbirth (Types 1 and 2). Urban women with ordinary employment have the fewest children and the highest age at childbirth (Types 5,6 and 8). Amongst urban women with long-term employment, individuals with the work trajectory of Type 7 seem to be more attached to traditional family values, and to have had early inactive periods for childbirth and childcare. Compared to other groups, the work trajectories of urban women are the most affected by family formation events, indicating that the relatively high level of conflicts between family responsibilities and full-time work they experienced.

The difference in the number of children between rural residents is not significant. The only exception is that rural women with a history of long-term ordinary employment have had, on average, fewer children than respondents from other clusters, indicating a similar but weaker relationship to that shown in urban areas (Type 8). The differences in age at first birth between rural residents are also small. These results imply that the family values of rural residents are more homogeneous than those in urban areas. It also seems that work experiences in the formal sector may have had an effect on the decision around the total number of children, but not necessarily on the time of having the first child. As discussed in Section 2.3.6, the work trajectories and family trajectories are associated with each other. Work-related experiences are usually entangled with experiences from other domains, such as family experiences (Börsch-Supan et al., 2013). For instance, interruptions of work histories can come from childbearing behaviours and care provision behaviour in the past.

Considering all the associations with individual characteristics explored here, the impact of childhood is relatively low, whilst educational attainment has the largest impact on life trajectories that is related to both work and family domains. This is in accordance with results from many existing studies; i.e. that better educational attainment was associated with stronger attachment to the labour market, less involvement in family responsibilities and better rewards from work (such as income, work position and work satisfaction) (Lyberaki *et al.*, 2013; McMunn *et al.*, 2015; Scherger *et al.*, 2016).

6.4 Changes in work histories across cohorts

The differences in labour force participation and labour market exit between age groups have been discussed in Sections 4.2 and 4.3 respectively. This section investigates the changes in work histories across cohorts and whether there is increasing heterogeneity between different subgroups. Given the pace and scale of the changes in the Chinese labour market outlined in Section 1.4, it is important to assess the differences in the experiences of the different generations that comprise the current older population. These groups experienced the social and economics events in the past sixty years at different stages of their life course and the impact of the events will necessarily be shaped by these differences in timing. For example, in terms of the restructure of SEOs and the public pension system, the 75 and over age cohort (born before 1939) would have been at least in their 50s in the 1990s and starting to retire, whilst the 60-64 age cohort (born in 1949-1953) would have been in their prime working life and more likely to be affected by such events. Thus, it will be interesting to analyses how transformations in the background contexts shaped the working lives of different cohorts. In order to assess the extent of changes in work histories across cohorts, the author compares the mean duration spent in different economic activity states over the entire working life from ages 20 to 60 (Table 6.1) and the distribution of cluster membership across birth cohorts (Table A.9)[18]. Respondents are grouped into four age (and birth) cohorts: age 60-64 (born in 1949-1953), 65-69 (born in 1944-1948), 70-74 (born in 1939-1943) and age 75 and over (born before 1939). For urban women, the 55-59 age cohort (born in 1954-1958) is also included. Results show that while the de-standardisation of work trajectories is experienced by younger cohorts due to the transformation of the economic and welfare regimes since the 1980s, differences between urban and rural areas and between men and women remain large.

[18] Table A.9 reflects quite similar information as Table 6.1 so the results discussed in Section 6.4 are mainly based on Table 6.1.

Table 6.1 Durations of economic activity states by birth cohort (years)

a) Urban men (N=960)

Duration	1949-1953	1944-1948	1939-1943	before 1939
Economically inactive	4.8	4.3	3.9	3.5
Own agricultural activities	2.1	2.1	1.4	1.3
Agricultural employment	1.2	1.5	1.9	1.4
Bianzhi employment	5.8	8.9	10.4	11.7
Non-*Bianzhi* employment	18.3	16.2	15.1	15.9
Self-employment	1.6	1.2	1.2	1.0
Military experiences	0.7	1.3	1.2	0.8
Multiple jobs	1.4	0.6	0.9	0.4
Total	36	36	36	36

b) Urban women (N=999)

Duration	1954-1958	1949-1953	1944-1948	1939-1943	before 1939
Economically inactive	8.9	8.8	7.3	6.9	9.4
Own agricultural activities	4.2	2.9	3.6	2.3	1.6
Agricultural employment	0.7	1.8	3.5	3.8	3.2
Bianzhi employment	3.1	3.8	3.5	4.1	3.7
Non-*Bianzhi* employment	11.9	12.2	11.4	12.6	12.2
Self-employment	1.7	1.3	0.9	0.7	0.6
Military experiences	0.0	0.1	0.1	0.0	0.0
Multiple jobs	0.6	0.2	0.6	0.5	0.2
Total	31	31	31	31	31

c) Rural men (N=2,825)

Duration	1949-1953	1944-1948	1939-1943	before 1939
Economically inactive	2.1	2.0	2.7	3.9
Own agricultural activities	20.9	18.8	15.7	11.6
Agricultural employment	4.7	8.5	11.3	14.4
Bianzhi employment	0.5	0.5	0.6	0.3
Non-*Bianzhi* employment	2.9	2.4	2.3	2.7
Self-employment	1.0	0.7	0.9	0.8
Military experiences	0.1	0.1	0.1	0.1
Multiple jobs	3.7	3.0	2.4	2.1
Total	36	36	36	36

d) Rural women (N=3,029)

Duration	1949-1953	1944-1948	1939-1943	before 1939
Economically inactive	4.1	3.9	4.8	7.0
Own agricultural activities	24.9	21.2	17.4	12.1
Agricultural employment	4.9	9.1	12.1	15.3
Bianzhi employment	0.0	0.0	0.1	0.0
Non-*Bianzhi* employment	0.5	0.6	0.5	0.6
Self-employment	0.5	0.2	0.5	0.3
Military experiences	0.0	0.0	0.0	0.0
Multiple jobs	1.0	0.9	0.5	0.7
Total	36	36	36	36

Source: Author's own analysis using the CHARLS 2014 Life History Wave.

6.4.1 Cohort differences amongst urban residents

The differences between cohorts in the average duration spent in various economic activity states are the most significant amongst urban men, indicating that urban men are the most sensitive to the changes in the labour market over the years in comparison to urban women and rural residents. Several features on the cohort differences amongst urban residents stand out. The first one is the sizeable decline in the duration of *Bianzhi* employment. The duration is 11.7 years for the oldest cohort but only 5.8 years for the youngest cohort (Table 6.1). Table A.9 reflects a similar trend, illustrating that the share of clusters containing long-term employment with *Bianzhi* (C5 and C6) decreased from 31.3% and 6.6% for the oldest cohorts to 14.6% and 14.2% for the

youngest cohorts. The changes correspond to the lower share of SOEs in economy and the flow of labourers into private organisations in recent years (see Section 1.3).

Second, the durations of economic activities which are related to the new economic forms are longer amongst younger cohorts. According to Table 6.1, the mean duration of ordinary employment is the longest for the youngest cohort of urban men (18.3 years) and is the shortest for the oldest cohorts (15.9 years). in addition, the duration of self-employment, multiple jobs at the same time and inactivity also increased slightly across the four cohorts (0.6, 1 and 1.3 years respectively). The trend is not very significant in Table A.9, but is implied by the higher proportion of Type 1 'Limited economic activities', where individuals mainly limited working years, but also with more heterogeneous and less predictable experiences.

Thirdly, there are noticeable changes in the duration of agricultural employment and military service, both of which are related to the planned economy system. Both states lasted longer in the life course of the 70-74 age group (born in 1939-1943) and the 65-69 (born in 1944-1948) birth cohorts, and lasted shorter for the youngest age cohort (age 60-64, born between 1949-1953) and the oldest cohort (age 75 and over, born before 1939) as well (Table 6.1). This highlights that the work trajectories of respondents born between 1939-1948 were more seriously affected by changes in the planned economy system than the cohorts born before or after them. Their prime years in the labour market overlapped with the period from the late 1950s to early 1970s, when the control on the economy and residents' everyday lives was at its highest.

All the three aspects above reflect the impact of the labour market; the work trajectories of individuals are more likely to be shaped by relevant social events rather than their own voluntary choices. The last remarkable change is the decline in the total number of working years amongst urban male labourers. Table 6.1 shows that here is a notable increase across cohorts in the share of those with the work trajectory of 'Type 9 Long-term employment and early labour market exit', highlighting the fact that recent urban labourers tend to leave the labour market earlier than previous generations. Two reasons may explain this trend. On the one hand, an increasing proportion of urban employees have participated in the OPP and become secure with pension benefits, providing them the option to leave the labour market when reaching the SPA. On the other hand, the 'Lay-off Wave' in the 1990s resulted in involuntary exit of employees, many of those who were in their 40s and 50s failed to find new jobs and thus prematurely left the labour market.

Compared to urban men, the cohort effect on work histories amongst urban women is subtler (Table 6.1). Firstly, there is a decrease in the proportion of employment with *Bianzhi* across the

four birth cohorts, but it is much less marked than that found amongst their male counterparts at just 0.3-0.5 years (Table A.9). It is possible that employment with *Bianzhi* only consists of a small part of urban women's career lives, so the change of this state is less likely to be reflected in average durations. Secondly, the 70-74 age group (born in 1939-1943) and the 65-69 age group (born in 1944-1948) similarly experienced more control on their economic activities from the authority as did urban men, which is reflected by the shorter average periods of inactivity and longer durations of agricultural employment and military experiences (Table A.9). Thirdly, urban women experience a consistent increase in self-employment across cohorts as found amongst urban men, but there was no expansion in the period of ordinary employment. Lastly, the trend towards earlier labour market exit is also significant amongst urban women. The duration of inactivity for the oldest cohorts is 14.8 years, this then fell to 11.5 years, and returned to 12.2 and 14.1 years for the two younger cohorts (Table 6.1). This trend is also reflected in Table A.9: when comparing the three clusters of employment (Types 6 to 8), the proportion of Type 6 (employment with early exit) increased across cohorts, but the proportion of both Types 7 and 8 (employment with late labour market exit) declined. These figures show that inactivity in early years (associated with family formation) and late exit have become less common for most urban female employees and younger cohorts of women now tend to leave the labour market at 50 or 55 (the SPA for standard retirement).

To summarise, the older cohorts of urban residents are more likely to have long-term *Bianzhi* work over the life course than the younger age groups. In contrast, the work trajectories younger age cohorts are more individualised, showing increasing flexibility and decrease engagement in the labour market at the same time. They spent more years in non-*Bianzhi* employment, self-employment, their own agricultural activities and multiple jobs, had more jobs on average and were more likely to have the work trajectories of 'mid-life career transformations'. These changes are in accordance with the development of market economy since the 1980s, when private enterprises and other economic organisations have increased while the state-owned enterprises have declined. New forms of economic activities, such as self-employment were allowed and resulted in more diverse and flexible work trajectories.

6.4.2 Cohort differences amongst rural residents

Compared to urban residents, the changes in the work trajectories of rural residents are smaller, which reflect that the economic structure in rural areas is more stable over the past several decades. Amongst rural residents, the most significant change across cohorts has been the shrinking of the share of working lives engaged in agricultural employment and the expansion of individual agricultural activities over the life course. Amongst rural men, the former state

decreased from an average of 15.8 years amongst the oldest cohort to just 7.9 years amongst the youngest cohort (Table 6.1). Amongst rural women, the duration increased from 17.7 to 8.7 years (Table 6.1). This state declined in prominence after the dissolution of collectivised agriculture in the late 1970s. Instead, household agricultural activities became the major type of agricultural work; the average duration of own agricultural activities increased from 13.5 years amongst the oldest cohort of men to 21.3 years amongst those men born in 1949-1953 (Table 6.1); the change amongst rural women was from 14 to 25.6 years respectively (Table 5d). This shift is also reflected in Table A.9; the different distribution of agriculture-dominant clusters across cohorts shows that agricultural employment is likely to have lasted until age 50 amongst the oldest birth cohort but lasted only until age 30 amongst the youngest birth cohort.

Similar to the experiences of those living urban areas, there is an increase in the share of working life spent engaged in new economic activities across cohorts. The increase in the duration spent holding multiple jobs (from 2.3 to 4 years, Table 6.1), reflects the fact that the younger cohorts of rural men are more likely to have been migrant workers. Table A.9 reflects similar information on the increase of multiple jobs holders (Types 8, 9, 10 and 12 of rural men, Type 4 of rural women). This change indicates the growing prevalence of migrant workers in recent years, who engage in both agricultural work and non-agricultural work - moving between rural and urban areas in different seasons of the year.

In contrast to the trend observed in urban areas, rural residents from younger births cohorts are more actively engaged in work and thus there is no discernible trend towards early labour market exit. Across cohorts, the mean duration of working life spent in inactivity has declined by 1.8 and 3.4 years for rural men and women respectively (Table 6.1). In general, rural residents' working patterns did not change much over the decades and more recent cohorts are working as intensively as in the past, reflecting the lack of pension provision in rural areas.

Considering results from both living areas at the same time, the most significant change in work trajectories is increasing individualisation in labour market decisions, most of which are explained by the changes in the labour market itself. The results highlight that the changes in individuals' labour market behaviour can be largely explained by the transformation of the labour market over the past several decades. The impact on working lives of elements from the previous planned economy system has declined over the past decades, whist the share of time working in the private sector and in other new economic forms has increased. Living through these remarkable changes has resulted in increasing diversity in the labour market experiences of older adults in China. The growth in social heterogeneity amongst younger cohorts is clear. In the 1990s, when the market economy began to come into shape, respondents from the youngest

cohort in this study were at least aged 40. Thus, it can be difficult for them to transfer to another sector or organisation. However, whether this will continue is a moot point. Today's current middle-aged adults have been involved in the new economic system since the beginning of their career lives and they will have more options in adjusting their work trajectories.

The gap between urban and rural labour markets remains large. Rural residents work for much longer years and continue to work to advanced ages, as they do not have sufficient financial resources to support their old age. In contrast, the duration of inactivity amongst urban residents is gradually growing as a result of earlier labour market exit, which may in turn result in greater financial risk in the pension public system. In terms of the pace of change in gender differences, it appears that women's response to the changing labour market has been slower than men, especially in urban areas.

6.5 Chapter summary

As the third empirical chapter of this thesis, this chapter unravels the patterns of work histories of older adults in China. These results provide an interesting case study, as China is a country with very different economic and welfare regimes as well as work and gender ideology compared to the western context in the existing literature, and its economic and social transformation over the past sixty years is unique in terms of both scale and pace of change. Results show that the inequalities in the labour market between different social groups have developed over the life course (e.g. inactivity in women's early years); such inequalities may be under-estimated within research that only focuses on a single time point in later life. In this sense, analysis of the entire work trajectories in Chapter 6 is important for achieving a full understanding of inequalities in the labour market and labour market outcomes in later life presented in Chapters 4 and 5. The rest of this section outlines the main finds and their links to the other empirical chapters.

Results confirm the existence of heterogeneity in the work histories of Chinese individuals. In terms of urban-rural differences, the work pathways of today's older adults have been strongly shaped by the segmentation of the labour market between living areas that has persisted over the past half century. During their working lives, older urban residents have mainly engaged in 'ordinary employment' and 'employment with *Bianzhi*'. In contrast, older people in rural areas have experienced relatively homogeneous work histories - mainly related to agricultural work. In particular, the stark urban-rural differences in the timing and pattern of leaving the labour market in later life reflect the significant differences which still prevail in entitlements to pension benefits between areas. Urban residents, especially those who are involved in the formal sector, have tended to leave the labour market at earlier ages. There is little evidence of voluntary late exit or

work after retirement, although this particular analysis did not extend beyond age 60. These results are in consistent with the findings in Chapters 4 and C5 – as opposed to the increasing empirical evidence on phased retirement in the Western literature (Kim and DeVaney, 2005; Giandrea et al., 2009; Cahill et al., 2015; Hasselhorn and Wenke, 2015), the traditional one-time and clear-cut exit from the labour market continues to be the norm in the urban areas of China. The pattern of proceeding to retirement directly from previous work positions may reflect that urban employees in China lack the opportunity to extend their working lives under the labour market policies.

The comparison of work histories between men and women reveals that the model of dual-earner families with full-time work is the norm in China. The gender differences in work histories are much smaller than the ones in the western context, indicating that the institutional background has had a larger impact than the norms of division of work and family responsibilities between gender in China. However, the analysis also shows that some older women faced difficulties in combining full-time work and family responsibilities, especially those in the formal sector, which in part reflects the lack of childcare service after the economic reform. The work pathways of current generations of Chinese older women contain more periods of inactivity and fewer accumulated years in work than men, indicating that women were more likely to interrupt work for family responsibilities, such as child-bearing and child-rearing. Furthermore, urban women's greater family responsibilities may have meant that they had fewer opportunities to achieve seniority positions whilst in work, with consequent lower wages and subsequent pension benefits. In rural areas, older women are more likely to experience being "left behind" than their partners, remaining working in the countryside and taking care of the land and family members (Wu and Ye, 2016; Ye *et al.*, 2016).

The gender differences are further exacerbated by current pension policies, especially in urban areas, which set a lower SPA for women, meaning that women's working years are curtailed at the end of their working lives as well as during periods of family formation. With benefit payments linked to years of contribution, this may negatively affect women's financial wellbeing in later life.

Second, in terms of the pace of changes in work histories, on the one hand, there is a process of de-standardisation, mainly shown by the increasing diversity of economic activities, where the impact of the strictly regulated labour market under the planned economy prior to 1978 has weakened. On the other hand, the significant differences between urban and rural areas and between men and women persist. Different from the findings in the western context, there is no sign of convergence of work histories between different groups. The inequalities in the labour

market over the life course will continue to be the case in the years to come, at least for the current older population in China.

Specifically, the comparisons of work trajectories across cohorts show that the average length of working life in urban China is getting shorter rather than longer, with more recent cohorts of urban elders retiring earlier. Although the changes in the working years are relative small, urban residents may continue to work less in the years to come, which add pressure to the viability of the public pension system.

Third, results in this chapter indicate the persistent and strong associations between individual characteristics and the life trajectories in both work and family domains. Education is seen to have had an important impact on the work trajectories and social mobility of individuals. Higher educational attainment is related to higher probabilities of later family formation ages and more engagement in the formal sector. Results also shown an early experience of employment within *Bianzhi* was also crucial for a long duration of such employment. Those without early experiences in the formal sector were less likely to be a member of the system over the life course. Investing in education and tackling inequities early in the life course should be part of any future strategy to reduce inequalities in later life.

Results in this study show that even when the impact of institutional factors came to the peak during the pre-reform era, individual characteristics (education attainment and early experiences in the formal sector) still play important roles in shaping the work trajectories. Similarly, although the gender differences of the work trajectories and the pace of de-standardisation in China do indeed differ from findings in the western context in part because of work ideology and the institutional background, there are important differences by the number of children and also by parental characteristics. Such findings highlight the importance of further research to investigate the association between individual characteristics, experiences over the life course and outcome in later life.

Lastly, the investigation of work trajectories reveals some associations between work trajectories and labour market behaviour in later life, which provide guidance for multivariate analysis in Chapters 7 and 8. The most significant difference exist between work experiences in the informal and formal sector and work experiences in the informal sector appear to related to more working years and late labour market exit. The work pathways of long-term experiences in the informal sector appear to lead to longer stay in the labour market and late exit. The impact of early experiences, as discussed earlier this section, is also reflected. These associations are further investigated in Chapters 7 and 8.

Chapter 7 Results IV: Factors influencing the labour force participation of older adults

7.1 Overview

So far, this thesis has presented a comprehensive picture of the patterns of labour market behaviour at the descriptive level by focusing on different time points over the life course. As shown in Chapters 4 to 6, the most significant heterogeneity in labour market behaviour exists between urban and rural residents and between men and women, which has persisted across cohorts. In addition, there are variations in labour market behaviour between groups with different individual and family characteristics. Based on these results, Chapters 7 and 8 further examine the importance of potential factors influencing the labour market behaviour in later life using multivariate logistic models. Following the conceptual framework developed in Section 2.5, the impact of individual characteristics, family characteristics and work histories in the past are analysed in order. Results in Chapters 7 to 8 provide further details on the understanding of the patterns of labour market behaviour presented in Chapters 4 to 6 by explaining the potential cause of heterogeneity and providing solutions for reducing inequalities in the labour market.

The analysis in Chapters 7 and 8 makes contributions to the existing literature from two aspects. On the one hand, they highlight the importance of the interactions with family members in shaping labour market decisions, an area which is under-researched in the Chinese context (see Section 2.5). This thesis pays particular attention to the impact of material transfers and care provision on labour market behaviour in later life and attempts to raise awareness of their importance in the policymaking process, which has received limited attention in China at present. Concerning the wider literature, this thesis distinguishes the impact of care provision to different family members, especially the importance of grandparenthood, which is seldom the case in existing literature. On the other hand, this thesis provides new evidence on the accumulated impact of long-term work experiences on labour market behaviour in later life. As opposed to the large body of literature on the impact of proximate factors on labour market behaviour in the Chinese context, relevant research on the impact of long-term factors is very limited. To the best of the author's knowledge, this is one of the first pioneering enquiry to investigate the link between early work trajectories and labour market outcomes in later life using life history data. Results in this chapter highlight the importance of further research to investigate the association between ascribed status, experiences over the life course and outcomes in later life as more longitudinal databases become available in the research community.

Chapters 7 and 8 address the final two research questions, i.e. *'What are the correlates of the labour force participation of older adults and how can they explain the heterogeneity in labour force participation between different social groups?'* and *'What are the predictors of the labour market exit in later life and how can they explain the heterogeneity in labour market exit between different social groups?'* The outcome variables for the Logistic Regressions in these two chapters are the stock and flow of labourers respectively. It is interesting to examine if there are differences in the impact of the same series of variables regarding the two different outcome variables.

This chapter investigates the factors influencing the labour force participation of older adults in 2013. Sample A was used for data analysis in this chapter, which includes 17,316 respondents from the CHARLS Wave 2. Logistic Regression Models A1, A2 and A3 were developed sequentially, which focus on the correlates of labour force participation from different levels. The binary outcome variable is the labour force participation in 2013 (see also Section 3.5.4). Specifically, Model A1 includes individual characteristics as explanatory variables (N=16,325); Model A2 further includes family characteristics as explanatory variables on the basis of significant variables in Model A1 (N=15,651); Model A3 includes indicators of work histories on the basis of significant individual and family characteristics in Model A2 (N=7,397). The minimum age of the respondents in Model A3 is restricted to 60 (55 for urban women) as the independent variables explore the impact of the complete work trajectories in the past.

The rest of this chapter discusses the results of Models A1, A2 and A3 respectively in Sections 7.2, 7.3 and 7.4. Section 7.5 concludes this chapter by reviewing the correlates of the labour force participation in later life.

7.2 Individual characteristics as the correlates of the labour force participation in later life

This section investigates the association between individual characteristics and labour force participation in 2013. Analysis on the patterns of labour market behaviour in Chapters 4 to 6 has shown that there are significant variations in the labour market behaviour between groups with different individual characteristics. The results of these bivariate analysis can, however, be confounded by the mediating of the impact of unobserved third factor(s). For example, the relationship between health and being in work may be confounded by age. Thus, this section investigates the importance of individual characteristics using multivariate analysis, including age, health status and available financial resources in later life. Based on theoretical and empirical evidence from existing literature and descriptive results in Chapter 4, the author provides some

hypotheses on the association between individual characteristics and labour force participation as below:

H1.1 The increasing age is related to a lower probability of labour force participation in later life.

H1.2 Health status is negatively related to the probability of labour force participation in later life.

H1.3 SES is negatively related to the probability of labour force participation in later life.

H1.4 The receipt of pensions from the Occupational Pension Programme and the Residents' Social Pension Programme is related to a lower probability of the labour force participation in later life.

Regarding H1.1, the negative association between the increasing age and labour force participation has been reported in existing literature (e.g. Dahl, 2000, see Section 2.3.1.1); descriptive analysis in Chapter 4 has confirmed such an association as well. A similar age effect is expected to be reflected by the multivariate analysis in this chapter, where age group is used as the indicator of age.

Regarding H1.2, health status has been shown to be important in existing literature since the deterioration of health is related to lower capability of work (e.g. Disney *et al*., 2006, see Section 2.3.2); the descriptive results in Chapter 4 have provided evidence on the variations in labour force participation due to health status as well. This chapter analyses whether the prevalence of IADL difficulties and chronic illnesses makes an impact on labour force participation. The first indicator (the prevalence of IADL difficulties) is frequently used by existing studies whereas the impact of having any chronic illnesses is less studied (see Section 2.3.2). The two indicators of health status are added to the same model as the correlation matrices discussed in Section 3.6.4 show that their correlation is low and the inclusion of them in the same model is unlikely to lead to multicollinearity or biased estimations. While the impact of ADL difficulties is investigated as well, this variable is only used in alternative models since it is highly correlated with the prevalence of IADL difficulties (see Section 3.6.4).

Both H1.3 and H1.4 are related to the importance of financial resources to labour force participation in later life. Existing literature has shown that sufficient financial resources facilitate the labour market exit of older adults since available financial resources secure the financial wellbeing of older adults after they leave the labour market; SES and the receipt of pensions are the major measurements of financial status that are used in empirical studies (e.g. Radl, 2013, see Sections 2.3.3 and 2.3.4). Regarding H1.3, Chapter 4 has shown that the labour force participation in 2013 varies between groups with different educational attainment and house ownership, but smaller in terms of household expenditure per capita. This chapter further analyses whether

these variables are significantly related to the labour market behaviour using multivariate analysis. Regarding H1.4, Chapter 4 has shown that pension benefits are one of the most important income sources in later life and there are differences in labour force participation between recipients and non-recipients. This chapter investigates the impact of the receipt of pensions from the OPP and the RSPP, which are the major public pension programmes in China. The importance of the two programmes in relation to labour market behaviour can be different since the coverage and the benefit levels of the two programmes vary significantly.

In order to test these hypotheses of the impact of individual characteristics, Model A1 was developed. Table 7.1 reports the odds ratios (ORs) and p-values of explanatory variables in Model A1. The results show that individual characteristics are fundamental to the labour market decisions of older adults.

The results of Model A1 confirm the negative association between age and labour force participation as suggested by H1.1. Older age groups are associated with a lower probability of labour force participation amongst all respondents: the ORs of the 50-54, 55-59, 60-64, 65-69 and 70 and above age groups are smaller than 1 and the p-values are significantly smaller than the critical values ($p<0.05$ for the 50-54 age group, $p<0.001$ for other groups); these figures mean that the odds of labour force participation of these older age groups are smaller than the reference group (the 45-49 age group), holding all other variables constant. For example, the OR of urban men aged 70 and above is 0.04 ($p<0.001$), which can be interpreted as the odds of labour force participation of men aged 70 and above is 0.04 times the odds of urban men aged 45-49 at the 99.9% confidence level.

Apart from the association between age and labour force participation, the age indicator also reflects the impact of the public pension programmes on labour force participation. For urban men, the ORs of the three age groups above the SPA of the OPP (age 60) is close to each other (ORs=0.10, 0.10 and 0.04, $p<0.001$); in contrast, the ORs of the two age groups below the SPA are larger (ORs=0.51 and 0.22, $p<0.05$ and $p<0.001$). The results for urban women are similar, that respondents above the SPA (age 55) have similar ORs (ORs=0.29, 0.22 and 0.20, $p<0.001$) whereas the OR of the 50-54 age group is much larger (OR=0.65, $p<0.05$). The difference in labour force participation between age groups above and below the SPA of the OPP indicates that approaching the SPA is highly associated with the probability of labour force participation. By contrast, the difference in the ORs between age groups above and below the SPA of the RSPP is minor amongst rural residents. Instead, there is a gradient of decline in the ORs of labour force participation amongst rural residents across different age groups. Such results indicate that the SPA is an

Table 7.1 Model A1: Odds ratios of being economically active in 2013 by individual characteristic (Sample A)

VARIABLES	A1.1 Urban men	A1.2 Urban women	A1.3 Rural men	A1.4 Rural women
Age group (Reference group: 45-49)				
50-54	0.51*	0.65*	0.75	0.78*
	(0.273 - 0.946)	(0.442 - 0.969)	(0.515 - 1.078)	(0.623 - 0.968)
55-59	0.22***	0.29***	0.58**	0.61***
	(0.125 - 0.401)	(0.189 - 0.433)	(0.407 - 0.812)	(0.489 - 0.757)
60-64	0.10***	0.22***	0.40***	0.49***
	(0.056 - 0.187)	(0.141 - 0.344)	(0.284 - 0.576)	(0.391 - 0.625)
65-69	0.10***	0.20***	0.23***	0.34***
	(0.053 - 0.187)	(0.118 - 0.330)	(0.156 - 0.328)	(0.261 - 0.440)
70+	0.04***	0.07***	0.09***	0.11***
	(0.022 - 0.079)	(0.040 - 0.122)	(0.063 - 0.128)	(0.088 - 0.147)
Have any IADL difficulties	0.25***	0.51***	0.24***	0.44***
	(0.169 - 0.381)	(0.341 - 0.756)	(0.201 - 0.282)	(0.387 - 0.503)
Have any chronic illnesses	1.08	0.84	0.71***	0.76***
	(0.836 - 1.383)	(0.645 - 1.085)	(0.602 - 0.835)	(0.664 - 0.863)
Educational attainment (Ref. group: No formal education)				
Did not finish primary school	0.77	0.97	1.35**	0.89
	(0.405 - 1.461)	(0.584 - 1.628)	(1.083 - 1.692)	(0.766 - 1.042)
Finish primary school	0.74	0.88	1.33*	0.82*
	(0.411 - 1.344)	(0.552 - 1.402)	(1.069 - 1.646)	(0.689 - 0.964)
Finish middle school	0.66	0.90	1.28*	0.81*
	(0.372 - 1.185)	(0.575 - 1.408)	(1.003 - 1.627)	(0.660 - 0.988)
High school or above	0.58	1.08	1.16	0.78
	(0.326 - 1.036)	(0.680 - 1.713)	(0.828 - 1.623)	(0.552 - 1.114)
No house ownership	0.88	0.85	0.95	0.84*
	(0.648 - 1.205)	(0.614 - 1.175)	(0.777 - 1.172)	(0.711 - 0.989)
Quintile of household expenditure per capita (Ref. group: Lowest 20%)				
60%-80%	0.89	1.12	1.17	0.94
	(0.625 - 1.277)	(0.776 - 1.628)	(0.937 - 1.455)	(0.789 - 1.124)
40%-60%	0.79	1.01	1.27	0.89
	(0.556 - 1.134)	(0.697 - 1.476)	(1.013 - 1.587)	(0.740 - 1.060)
20%-40%	0.84	0.98	1.22	1.06
	(0.587 - 1.203)	(0.663 - 1.451)	(0.970 - 1.529)	(0.879 - 1.266)
Top 20%	0.82	0.86	1.06	0.81*
	(0.568 - 1.179)	(0.580 - 1.265)	(0.844 - 1.334)	(0.678 - 0.976)
Receipt of the Occupational Pensions	0.28***	0.22***	0.58***	0.50**
	(0.211 - 0.383)	(0.165 - 0.290)	(0.426 - 0.788)	(0.334 - 0.759)
Receipt of the Residents' Social Pensions	1.38	0.98	1.09	0.98
	(0.839 - 2.265)	(0.656 - 1.468)	(0.895 - 1.318)	(0.828 - 1.149)
Region (Ref. group: Eastern)				
Central	1.41*	1.04	1.47***	1.23**
	(1.070 - 1.864)	(0.775 - 1.394)	(1.223 - 1.767)	(1.065 - 1.414)
Western	1.09	0.85	1.62***	1.59***
	(0.830 - 1.432)	(0.639 - 1.141)	(1.355 - 1.928)	(1.387 - 1.831)
Pseudo R-square	0.304	0.246	0.194	0.134
Observations	1,947	1,749	6,017	6,612

Note: 1) The star symbols indicate the p-values for ORs, where *** represents p<0.001, ** represents p<0.01, * represents p<0.05. 2) The 95% confidence intervals for ORs are reported in brackets.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

important determinant on the labour force participation of urban residents but not rural residents.

On the other hand, a negative association between having any chronic illnesses and labour force participation is found amongst rural men and rural women (ORs=0.71 and 0.76, $p < 0.001$) but not urban residents. Compared to the prevalence of IADL difficulties, the ORs of having any chronic illnesses are closer to 1, which indicate that the difference in labour force participation between groups with and without chronic illnesses is smaller. It appears that compared to IADL difficulties, some chronic illnesses may not affect individuals' work capacity directly and stop them from working.

The impact of all indicators of health status are more pronounced amongst rural residents. Rural residents in China are mainly engaged in agricultural work and are more likely to be affected by the negative impact of health status. This is in accordance with the findings in existing studies that health status has a greater impact on the labour market decisions of respondents from lower social classes, most of whom are low-skilled workers or manual workers (e.g. Wilson, 2001, see Section 2.3.2).

In terms of the impact of SES, supportive evidence for H1.3 is limited. The three indicators of SES have different associations with labour force participation. First, the association between educational attainment and labour force participation is only significant amongst rural residents. Rural men with moderate education levels experienced a higher probability of labour force participation compared to the illiterate group (ORs=1.35,1.33 and 1.28, $p<0.01$, $p<0.05$ and $p<0.05$); in contrast, rural women with moderate education levels experienced a lower probability of labour force participation (ORs=0.82 and 0.81, $p<0.05$).) The different results across the four subgroups imply that educational attainment has complex meanings in explaining labour force participation, including higher opportunity costs to leave the current work and higher motivation for social participation (see also Sections 4.3.2 and 4.5). Second, the variable of house ownership is only significant amongst rural women and those without their own properties are significantly less likely to work. This association indicates that the meaning of housing tenure is not limited to financial status, which is similar to the case of educational attainment. Third, the variable of annual household expenditure per capita is only significant for rural women and those ranked with the highest household expenditure experience a significant lower probability of labour force participation.

Lastly, concerning H1.4, the receipt of the occupational pensions is significantly related a lower probability of labour force participation across all of the four subgroups whereas receiving benefits from the RSPP is not a significant correlate. Receiving pension benefits from the OPP is

strongly related to a lower probability of labour force participation across all of the four subgroups (ORs=0.41, 0.25, 0.51 and 0.61, p<0.001, p<0.001, p<0.001 and p<0.05). The pension benefits from the OPP work as an important income source in later life and can lead to a lower probability of labour force participation. Conversely, the benefit level of the Residents' Social Pension Programme is very low and not adequate as the only income source for rural residents in later life. Thus, rural residents need to continue to work even if they are recipients of the Residents' Social Pension Programme.

The results in relation to H1.3 and H1.4 highlight the importance of stable income flows in later life. The impact of SES is much smaller than suggested by literature, possibly because SES is more likely to measure the long-term financial status of older adults (i.e. the stock of wealth), which is difficult to convert to cash in face of financial risks. Given that other kinds of income are uncommon (e.g. investment income) for older adults in China, the availability and the level of pension benefits are critical to the labour market decisions of older adults.

7.3 Family characteristics as the correlates of the labour force participation in later life

This section investigates the association between the labour force participation of older adults and their interaction with family members. Specifically, the impact of marital status, material transfers with family members and care provision to family members is analysed. All these aspects are shown to be important in shaping labour force participation in existing literature, whereas relevant studies in the Chinese context are limited (see Section 2.5). Based on theoretical and empirical evidence from the existing literature and descriptive analysis in Chapter 4, the author provides several hypotheses on their association as below:

H2.1 In terms of marital status, married elders with working spouses have a higher probability of labour force participation than individuals with other marital status.

H2.2 For older adults, the material transfers from family members are related to a lower probability of labour force participation; by contrast, the material transfers to family members is related to a higher probability of labour force participation.

H2.3 The care provision to family members is related to a lower probability of labour force participation of older adults.

Respecting H2.1, existing literature has shown that marital status is related to the probability of labour force participation and there is a tendency towards joint labour market exit of couples due

to the preferences for leisure (e.g. Whiting, 2005; see Section 2.3.5.1). The descriptive analysis in Chapter 4 has shown similar results. This chapter further tests these associations using multivariate analysis.

Respecting H2.2, existing literature has indicated that material transfers with family members in both directions can affect the labour market decisions in later life (e.g. Maurer-Fazio *et al.*, 2011; Svensson *et al.*, 2015; see Section 2.3.5.2). The importance of material transfers at the family level in the Chinese context is less studied in the Chinese context and the author is interested in its impact on labour force participation. This is especially the case since Chapter 4 has shown that the material transfers with children and parents are intensive.

Respecting H2.3, the time commitment to other family members has been shown to be related to a lower probability of labour force participation in both theoretical and empirical results (e.g. Greenhaus and Beutell, 1985; Heitmueller and Michaud, 2006; see Sections 2.4 and 2.3.5.3). Bivariate analysis in Chapter 4 has shown that care provision to family members is intensive and there are variations between groups with/without care provision, especially care provision to grandchildren. This chapter analyses whether care provision to grandchildren and parents is critical to the labour market decision of older adults; the care intensity is specified as Chapter 4 has shown that care intensity matters to the association between labour force participation and care provision to family members.

In order to test these hypotheses on the impact of family characteristics, Model A2 was developed. Model A2 contains variables at the individual and family levels at the same time, where the variables at the individuals are regarded as control variables. Table 7.2 reports the ORs and p-values of explanatory variables at the family level (see Table A.11 for full results). Compared to the results of Model A1, most individual characteristics remain significant with the presence of family characteristics in Model A2. This means that both individual and family characteristics are important correlates of the labour force participation in later life.

The impact of marital status suggested by H2.1 is supported by Model A2. Compared to the reference group (married respondents with working spouses), married respondents with non-working spouses have a significant lower probability of labour force participation (OR=0.20, 0.19, 0.26 and 0.28, $p<0.001$). These results confirm the propensity towards joint retirement of couples. On the other hand, other marital status is related to a lower probability of labour force participation. The category of being separated or divorced is significantly related to the labour force participation of urban men, rural men and rural women (ORs=0.17, and 0.46, $p<0.001$ and $p<0.05$). The category of being widowed is significant across all of the four subgroups (ORs= 0.20, 0.34, 0.25 and 0.41, $p<0.001$). These results demonstrate that the living arrangements and family

networks which are related to marital status may make an impact on the labour market decisions of older adults.

Concerning H2.2, the results of Model A2 confirm the impact of the material transfers with family members outside the nuclear family on the labour force participation of older adults. The category of 'no transfers' and 'transfers in both directions' are combined for better model interpretation as the latter category is not statistically significant when used as a separate category. On the one hand, the category of net recipients is significantly related to a lower probability of labour force participation of rural residents but not their urban counterparts (ORs=0.78 and 0.77, $p<0.01$ and $p<0.001$). Such an association highlights the importance of additional income from other family members for rural residents. Intergenerational material transfers can account for a large part of the total income of rural residents since their income levels are much lower than urban residents. On the other hand, the category of net providers is significantly related to a higher probability of labour force participation amongst men (ORs=1.59 and 1.41, $p<0.01$ and $p<0.05$). This may indicate that men are more likely to take responsibilities for supporting family members financially than women in the Chinese context.

Concerning H2.3, Model A2 reflects the different impact of informal care provision to grandchildren and parents on labour market decisions. A negative association between care provision to grandchildren and labour force participation is found amongst women. For urban women, the groups with 10-20 caring hours per week and more than 20 caring hours per week have a lower probability of labour force participation (ORs=0.38 and 0.61, $p<0.01$). For rural women, the group with more than caring 20 hours per week is related to a lower probability of labour force participation (OR=0.73, $p<0.01$). On the other hand, the association between care provision to parents and labour force participation is not significant, which is in accordance with the findings in Chapters 4 and 5 that the care provision to parents reflect the money commitment or contacts with them rather than the actual caring tasks.

Table 7.2 Model A2: Odds ratios of being economically active in 2013 by family characteristic (Sample A)

VARIABLES	A2.1 Urban men	A2.2 Urban women	A2.3 Rural men	A2.4 Rural women
Marital Status (Ref. group: Married, spouses working)				
Married, spouses not working	0.20*** (0.147 - 0.263)	0.19*** (0.139 - 0.272)	0.26*** (0.215 - 0.306)	0.28*** (0.240 - 0.332)
Separated/divorced	0.16*** (0.079 - 0.337)	0.67 (0.330 - 1.347)	0.43** (0.239 - 0.780)	0.45* (0.204 - 0.995)
Widowed	0.18*** (0.098 - 0.345)	0.33*** (0.207 - 0.524)	0.23*** (0.178 - 0.297)	0.37*** (0.309 - 0.437)
Intergenerational transfer (Ref. No transfer or both directions)				
Net recipient	1.10 (0.814 - 1.487)	0.92 (0.649 - 1.316)	0.78** (0.653 - 0.922)	0.77*** (0.675 - 0.884)
Net provider	1.59** (1.121 - 2.256)	1.07 (0.765 - 1.488)	1.41* (1.027 - 1.934)	0.72 (0.589 - 1.085)
Care provision to grandchildren (Ref. group: No care provision)				
Care provision to grandchildren: 0-10H/W	0.89 (0.579 - 1.354)	1.14 (0.720 - 1.820)	1.34 (0.993 - 1.814)	0.95 (0.759 - 1.187)
Care provision to grandchildren: 10-20H/W	1.11 (0.599 - 2.071)	0.38* (0.178 - 0.803)	1.11 (0.731 - 1.672)	1.24 (0.908 - 1.707)
Care provision to grandchildren: 20+H/W	0.79 (0.574 - 1.096)	0.61** (0.430 - 0.858)	1.05 (0.852 - 1.289)	0.73*** (0.632 - 0.841)
Care provision to parents (Ref. group: No care provision)				
Care provision to parents: 0-10H/W	1.69 (0.998 - 2.873)	0.96 (0.619 - 1.501)	1.54 (0.891 - 2.669)	1.09 (0.811 - 1.457)
Care provision to parents: 10-20H/W	1.58 (0.775 - 3.235)	1.59 (0.715 - 3.523)	0.86 (0.481 - 1.542)	1.12 (0.673 - 1.851)
Care provision to parents: 20+H/W	1.40 (0.563 - 3.483)	0.65 (0.314 - 1.363)	0.98 (0.422 - 2.255)	1.44 (0.805 - 2.589)
Pseudo R-square	0.357	0.301	0.275	0.196
Observations	1,817	1,714	5,578	6,542

Note: 1) The star symbols indicate the p-values for ORs, where *** represents p<0.001, ** represents p<0.01, * represents p<0.05. 2) The 95% confidence intervals for ORs are reported in brackets.
3) Respondents who reported to be never married are removed from the models for better interpretations of the models (less than 1%). 4) The results of individual characteristics are not reported; see Table A.12 for full results.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

7.4 Work histories as the correlates of the labour force participation in later life

This section investigates the associations between work trajectories over the life course and labour force participation in 2013. As discussed in Section 2.3.6, there is an emerging body of literature analysing the impact of early life experiences (e.g. Stone *et al.*, 2015). The majority of this literature is within the European context and relative studies in the Chinese context are rare. The author provides five hypotheses on the association between labour force participation and work trajectories as below based on the work typology of Chinese individuals, which was developed in Chapter 6. The category variable indicating the typical work trajectories of

individuals is used to test these hypotheses. Specifically, long-term ordinary employment and long-term agricultural work over the life course are set as the reference group as the two types of work trajectories are the most common amongst urban and rural residents respectively (Type 7 for urban residents and Type 1 for rural residents).

H3.1 Compared to long-term work experiences in the formal sector, long-term work experiences in the informal sector are related to a higher probability of labour force participation in later life.

H3.2 Interruptions of work histories are related to a higher probability of labour force participation in later life.

H3.3: Long-term inactivity is related to a lower probability of labour force participation in later life.

H3.4: For urban residents, work experiences of long-term Bianzhi employment have an impact on labour force participation which is different from work experiences of long-term ordinary employment.

H3.5: For rural residents, work experiences featuring having multiple jobs at the same time are related to a lower probability of labour force participation in later life.

First, regarding H3.1, the author expects that respondents with long-term work experiences in the informal sector have a higher probability of labour force participation in later life than respondents from the formal sector. Work experiences in the formal sector indicate more attachment to the OPP and other social protection programmes, and the impact of such experiences can accumulate over the working lives and result in better financial status in later life. The results of sequence analysis presented in Chapter 6 also indicate that individuals with long-term work experiences in the informal sector in early years are more likely to stay in the labour market until the end of the observation period.

The typical work trajectories in relation to H3.1 are different across the four subgroups. For urban residents, compared to the reference group (i.e. ordinary employment), agricultural work and self-employment are the typical work experiences of respondents from the informal sector. The relevant categories are 'Type 2 Long-term agricultural work', 'Type 3 Long-term multiple jobs' and 'Type 4 Long-term self-employment' for urban men, and 'Type 2 Long-term agricultural work', 'Type 3 Agricultural work & ordinary employment' and 'Type 4 Long-term self-employment' for urban women. For rural residents, compared to the reference group (i.e. agricultural work), the work trajectories indicating the formal sector are compared with the reference group, which include self-employment and employment. The relevant categories are 'Type 5 Long-term employment', 'Type 6 Ordinary employment & agricultural work' and 'Type 7 Long-term self-

employment' for rural men, and Type 6 'Long-term self-employment' and 'Type 7 Long-term employment' for rural women. Notably, self-employment has different meaning for urban and rural residents; self-employment is reported to be related to lower accumulations of pensions and poor financial status in existing studies (e.g. Schils, 2008) However, in the Chinese context, this situation may only apply to urban residents only as most rural residents do not have access to pensions. In contrast, self-employment is a sign of development in rural areas of China and shares many features of a productive small-business sector (Mohapatra *et al.*, 2007).

Second, inactivity over the work histories is shown to be related to a lower probability of working in advanced ages in existing literature; relevant studies used either work preferences or the probability of finding work as explanations for the association (e.g. Flippen and Fienda, 2000; Finch, 2014; see Section 2.3.6). In this thesis, inactivity of different lengths is expected to have different impact on the labour force participation in later life. On the one hand, the interruptions of work histories (a few inactive years as working intervals) are expected to relate to a higher probability of labour force participation due to the loss in financial gains and pension benefits (H3.2). On the other hand, the work trajectories of limited economic activities over the life course are expected to relate to a lower probability of labour force participation in later life (H3.3), since these respondents have very few working years and are likely to a lower preference for work.

Regarding H3.2, the relevant work trajectories are 'Type 8 Ordinary employment with other early experiences' and 'Type 9 Mid-life career transformation' for urban residents and 'Type 3 Inactivity and later agricultural work' for rural women, and interruptions of work are generally not observed amongst rural men. Respondents from the first group had early experiences of another work which are different from the dominating economic activity, such as military experiences or agricultural employment, or a short period of inactivity. Respondents of the second group transferred to other work in midlife. Both groups are more likely to work in advanced ages since their pension benefits accumulated in early years are not portable between work positions and thus they had fewer pension accumulations when they transferred to a new work in later life. Results in Chapter 6 show there is a clear difference for urban residents. Respondents of the third group are expected to work for longer years for similar reasons, although this is not clearly reflected in Chapter 6 as the majority of rural residents worked until age 60.

Regarding H3.3, the corresponding work trajectory is 'Limited economic activities over the life course', which is Type 1 for urban men and women, Type 9 of rural men and Type 5 of rural women. Rural residents with inactivity in later life (Type 8 for rural men and Type 2 for rural women) are also regarded as relevant to H3.3; they are expected to be less likely to stay in the labour market as respondents left the labour market prior to the end of the observation period.

Third, in terms of H3.4, engagement in *Bianzhi* employment over the life course may affect the decisions of labour market behaviour due to the privileged benefits of pensions and other social welfare which are related to *Bianzhi* employment (see Section 1.4). Thus, respondents with *Bianzhi* employment are more likely to be in good financial status and afford the option of not working compared to the reference group. H3.4 is tested by the category of 'Type 5 Long-term *Bianzhi* Employment' and 'Type 6 *Bianzhi* employment with other early experiences' for both urban men and women. Work trajectories of long-term *Bianzhi* employment are very rare amongst rural residents and not examined.

Within in the formal sectors, there can be differences in the work histories between *Bianzhi* and *non-Bianzhi* workers. *Non-Bianzhi* workers started to leave the labour market earlier and spent fewer years in the labour market. They left the labour market from ages 45 to 60 and there is a slight but there is a remarkable drop at 55. *Bianzhi* workers left their last jobs from ages 50 to 60. Very few of them quitted during the period from ages 45 to 50, and there is no significant drop at age 55. in terms of the labour force participation rate, a higher proportion of *Bianzhi* workers remained in the labour market until age 60. Engagement in *Bianzhi* employment over the life course may have complex meanings on the decision of labour market decisions. On the one hand, respondents with *Bianzhi* employment are privileged in terms of pension benefits, and are more likely to be in better financial status and afford the option of not working. on the other hand, they may have higher incentives to stay in the work due to different work preferences. This is proposed in Section 6.3.2, that there is a link between higher educational attainments, delayed family formation periods and high probabilities of having *Bianzhi* work over the life course.

Lastly, in terms of H3.5, long-term engagement in multiple jobs at the same time is expected to be related to a lower probability of labour force participation in later life. To a great extent, such work trajectories are the typical labour market behaviour of migrant workers from rural areas. The author assumes that compared to the reference group (respondents with long-term agricultural work), migrant workers are more likely to have poor financial status and less likely to afford inactivity or early exit from the labour market. This hypothesis can be tested with the categories of 'Type 2 Long-term multiple jobs', 'Type 3 Agricultural work & Multiple jobs' and 'Type 4 Multiple jobs in middle years' for rural men, and 'Type 4 Long-term multiple jobs' for rural women.

Model A3 was developed in order to investigate the impact of early work experiences on labour force participation in later life. Model A3 includes the variable of typical work trajectories and all the significant variables in Model A2 as control variables. The study sample is restricted to respondents 60 and over (55 and over for urban women) in Model A3. Table 7.3 reports the ORs

and p-values of the variable of typical work trajectories (See Table A.12 for full results). As the work typology for the four subgroups are different, the results of Model A3 are reported by subgroup.

Firstly, the results of Model A3 basically support the different impact of work experiences in the formal and informal sectors as suggested by H3.1. For urban men, the categories of 'Type 2 Long-term agricultural work' and 'Type 3 Multiple jobs at the same time' are related to ORs that are large than 1, which indicate a higher probability of labour force participation in later life (ORs=2.95 and 3.53, $p<0.01$ and $p<0.05$). The category of 'Type 4 Self-employment' is not significantly related to the probability of labour force participation compared to the reference group. The results for urban women are quite similar: the categories of 'Type 2 Long-term agricultural work' and 'Type 3 agricultural work with later employment' are related to a higher probability of labour force participation whereas the category of 'Type 4 self-employment' is not significant. For urban residents, engagement in agricultural work makes a significant difference on the probability of labour force participation in later life compared to engagement in employment over the life course, which may confirm the hypotheses that receiving pension benefits facilitate labour market exit of older adults. However, the difference in labour force participation between long-term employment and self-employment is small, indicating that self-employment can be a mixture of experiences in the formal and informal sectors for urban residents and not distinctive enough from the long-term employment.

Secondly, H3.2 is supported by the results of Model A3 amongst urban residents. Early experiences prior to the long-term employment (Type 8 for urban men and women) are significantly related to a higher probability of labour force participation for urban men but not for urban women (OR=2.23, $p<0.05$). These results indicate that urban men with interrupted work histories have to work for additional years to achieve the same years of contribution and the same pension benefits as others. However, this is less likely to be the case for urban women.

On the other hand, urban residents who experienced mid-life career transformations have a higher probability of labour force participation (ORs=3.87 and 13.52, $p<0.01$ and $p<0.001$). The reason is similar; such transformations, whether they are voluntary choices or involuntary outcomes due to the re-structure of the labour market, are very likely to result in the loss of years of contributions for pension benefits. As a result, respondents with such work trajectories need to extend their working years in later life to be able to claim pension benefits.

Table 7.3 Model A3: Odds ratios of being economically active in 2013 by typical work trajectory (Sample A, age 55 and over for urban women, age 60 and over for other groups)

VARIABLES	A3.1 Urban men
(Ref. group: Type 7 Long-term ordinary employment)	
Type 1 Limited economic activities	1.95 (0.839 - 4.516)
Type 2 Long-term agricultural work	3.12** (1.460 - 6.658)
Type 3 Long-term multiple jobs	3.82** (1.435 - 10.152)
Type 4 Long-term self-employment	2.28 (0.891 - 5.836)
Type 5 Long-term *Bianzhi* employment	0.95 (0.587 - 1.526)
Type 6 *Bianzhi* employment with other early experiences	1.15 (0.571 - 2.303)
Type 8 Ordinary employment with other early experiences	2.29* (1.138 - 4.604)
Type 9 Mid-life career transformation	3.78** (1.510 - 9.447)
Pseudo R-square	0.280
Observations	892

VARIABLES	A3.2 Urban women
(Ref. group: Type 7 Long-term ordinary employment)	
Type 1 Limited economic activities	2.16 (0.716 – 4.191)
Type 2 Long-term agricultural work	3.84*** (1.956 – 7.524)
Type 3 Agricultural work & ordinary employment	2.92** (1.368 – 6.225)
Type 4 Long-term self-employment	1.84 (0.659 – 5.119)
Type 5 Long-term *Bianzhi* employment	1.77 (0.840 – 3.728)
Type 6 *Bianzhi* employment with other early experiences	2.06 (0.726 – 5.825)
Type 8 Ordinary employment with other early experiences	1.57 (0.769 – 3.217)
Type 9 Mid-life career transformation	13.76*** (4.421 – 42.861)
Pseudo R-square	0.248
Observations	954

VARIABLES	A3.3 Rural men
(Ref. group: Type 1 Long-term agricultural work)	
Type 2 Long-term multiple jobs	0.82 (0.546 – 1.240)
Type 3 Agricultural work & multiple work	0.52** (0.347 – 0.785)
Type 4 Multiple jobs in middle years	1.12 (0.678 – 1.836)
Type 5 Long-term employment	0.58* (0.375 – 0.898)
Type 6 Ordinary employment & Agricultural work	0.75 (0.426 – 1.318)
Type 7 Long-term self-employment	0.37*** (0.208 – 0.664)
Type 8 Agricultural work & inactivity	0.45** (0.276 – 0.737)
Type 9 Limited economic activities	0.64* (0.369 – 0.895)
Pseudo R-square	0.255
Observations	2,613

VARIABLES	A3.4 Rural women
(Ref. group: Type 1 Long-term agricultural work)	
Type 2 Agricultural work with later inactivity	0.19*** (0.137 – 0.273)
Type 3 Inactivity & agricultural work	0.63 (0.332 – 1.211)
Type 4 Long-term multiple jobs	0.76 (0.446 – 1.295)
Type 5 Limited economic activities	0.45*** (0.332 – 0.599)
Type 6 Long-term self-employment	0.29** (0.123 – 0.674)
Type 7 Long-term employment	0.62 (0.285 – 1.334)
Pseudo R-square	0.240
Observations	2,938

Note: 1) The star symbols indicate the p-values for ORs, where *** represents p<0.001, ** represents p<0.01, * represents p<0.05. 2) The 95% confidence intervals for ORs are reported in brackets. 3) The results of individual and family characteristics are not reported; see Table A.13 for full results.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011), Wave 3 (2015) and the Life History Wave.

Thirdly, regarding H3.3, the impact of long-term inactivity is found to be significant amongst rural residents. The category of 'Limited economic activities' is not significant amongst urban residents. Such results indicate that the probability of working or urban residents with limited work experiences and those with intensive career lives are similar; this is possibly due to the fact that the probability of working in later life is quite low for urban residents after age 60. The category of 'Limited economic activities' is related to a lower probability of labour force participation in later life for rural residents (ORs=0.65 and 0.49, p<0.001). For rural residents, the limited economic activities over the life course indicate a low propensity towards work, which may already come into shape in early years – according to the CHARLS, working as full-time housewives or disability are the most important reason for long-term inactivity over the life course. On the other hand, the category of 'Agricultural work and inactivity in later years' is related to a lower probability of labour force participation in later life for both rural men and rural women (Type 8 for rural men and Type 2 for rural women, ORs=0.45 and 0.20, p<0.01 and p<0.001). The significance of this category indicates that the inactivity of rural residents in later life may be out of their voluntary choices as they have higher freedom in labour market decisions than urban residents.

Fourthly, regarding H3.4, evidence on the differences between *Bianzhi* employment and non-*Bianzhi* employment is limited. The categories of 'Type 5 long-term *Bianzhi* employment' and 'Type 6 *Bianzhi* employment with other early experiences' are not significant for either urban men or urban women. *Bianzhi* employment does not make a difference on the probability of working compared to the reference group - the possible reason is that these respondents have passed the

SPA of the OPP, and the impact from this programme, such as privileged income that lead to better financial status and earlier labour market exit once reaching the SPA has become minimal.

Lastly, regarding H3.5, the work trajectory of multiple jobs at the same time with early agricultural work (Type 3 for rural men) is related to a significantly lower probability of working compared to the reference group (OR=0.48, p <0.001). The work trajectories of 'long-term multiple jobs over the life course' (Type 2 for rural men and Type 4 for rural women) and 'Multiple jobs in middle years' (Type 4 for rural men) are not related to a lower probability of labour force participation. It is possible that the work trajectory of 'multiple jobs with early agricultural work' represents the labour market behaviour of migrant workers, who started to engage in non-agricultural work in middle years, and who are the most likely to be affected by such work trajectories in terms of financial status. Instead, the other two categories may indicate other social groups or just higher work intensity.

7.5 Chapter summary

This chapter analyses the factors influencing the labour force participation in later life. The impact of individual characteristics, family characteristics and work trajectories are identified and critically discussed. To a great extent, results from the multivariate analysis in this chapter support the hypotheses on the correlates of labour force participation in later life at different levels. Table 7.4 summarises the findings of Model A series by presenting whether a significant association is found.

First, individual characteristics are fundamental to the decision of labour force participation. The indicator of age confirms the age effect on labour force participation as suggested by H1.1 – increasing age is related to a lower probability of labour force participation. This is consistent with the existing studies discussed in Section 2.3.1.1, such as Dahl *et al.* (2000). On the other hand, the difference in labour force participation between age groups shows the importance of the SPA of the OPP. According to the results of models in this chapter, there is a gap in the ORs of labour force participation around the SPA. These results indicate that the OPP not only provides financial incentives on leaving the labour market but also sets restrictions on working after the SPA. This raise concerns about how voluntary the exit around the SPA can be – which is further tested in Chapter 8.

All the three indicators of health status show that poor health status is related to a lower probability of labour force participation, which is consistent with the existing literature discussed in Section 2.3.2, such as Bound *et al.* (1999). In this sense, the deterioration of health, which is commonly experienced by older adults, can act as constraints of labour force participation. In

other words, health status is more likely to be a push factor that stops people from working. Results also indicate that health status is more crucial to the labour market decisions of rural residents; compared to urban residents, rural residents are more likely to be affected by their health status due to their engagement in agricultural work in most cases. Specifically, considering the low diagnosis rate of chronic illnesses amongst rural residents, there can be an underestimation of the impact of chronic illnesses on their labour fore participation.

The associations between the three indicators of SES and labour force participation are different. and are only significantly related to the labour force participation of rural residents. Educational attainment is found to have a positive association with the probability of labour force participation for rural men but a negative association for rural women. Housing tenure is only significant for rural women – rural women without house ownership are less likely to work. In terms of household expenditure per capita, rural women with the highest expenditure have a much lower probability of labour force participation. Only the negative association between household expenditure per capita and labour force participation is in accordance with what has been suggested by domestic and international literature discussed (e.g. Radl, 2013; Chen et al., 2014; see Section 2.3.3). It is likely that these indicators have complex meanings apart from long-term financial status, and are related to other aspects which shape labour force participation.

The receipt of the occupational pensions is associated with a much lower probability of labour force participation. Results here support H1.4 in the sense that the occupational pensions are the most important financial resources in later life and work as incentives (pull factors) for labour force participation. In contrast, the association between receiving Residents' Social Pensions and labour force participation is not detected by the models. The different associations may be related to the different benefit levels of the two programmes. The benefit level of the Residents' Social Pension Programme is much lower and fail to support the living expenses of older adults once they stop working. The case of the RSPP is similar to some existing literature that the negative impact on the intensive margin rather than the extensive margin is found (i.e. the working hours rather than labour force participation decision).

Table 7.4 Summary of statistically significant variables in Model A series

a) the impact of individual and family characteristics, Models A1 and A2

	Model A1				Model A2			
	Urban men	Urban women	Rural men	Rural women	Urban men	Urban women	Rural men	Rural women
Individual characteristics								
Age group	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Have any IADL difficulties	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Have any chronic illnesses	No	No	Yes	Yes	No	No	Yes	Yes
Educational attainment	No	No	Yes	Yes	No	No	Yes	Yes
House ownership	No	No	No	Yes	No	No	No	No
Household expenditure per capita	No	No	No	Yes	No	No	No	Yes
Receipt of the Occupational Pensions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Receipt of the Residents' Social Pensions	No	No	No	No	No	No	No	No
Family characteristics								
Marital and spouse characteristics					Yes	Yes	Yes	Yes
Intergenerational transfer					Yes	No	Yes	Yes
Care provision to grandchildren					No	Yes	No	Yes
Care provision to parents					No	No	No	No

b) the impact of work histories, Model A3

Hypothesis	Urban men	Urban women	Rural men	Rural women
H3.1 Compared to long-term work experiences in the formal sector, long-term work experiences in the informal sector are related to a higher probability of labour force participation in later life.	Type 2 Long-term agricultural work - support H3.1 Type 3 Long-term multiple work - support H3.1 Type 4 Long-term self-employment - no evidence	Type 2 Long-term agricultural work - support H3.1 Type 3 Agricultural work & ordinary employment - support H3.1 Type 4 Long-term self-employment - no evidence	Type 5 Long-term employment - support H3.1 Type 6 Ordinary employment & agricultural work - no evidence Type 7 Long-term self-employment - support H3.1	Type 6 Long-term self-employment - support H3.1 Type 7 Long-term employment - no evidence
H3.2 Interruptions of work histories are related to a higher probability of labour force participation in later life.	Type 8 Ordinary employment with other early experiences - support H3.2 Type 9 Mid-life career transformation - support H3.2	Type 8 Ordinary employment with other early experiences - no evidence Type 9 Mid-life career transformation - support H3.2	No relevant trajectories	Type 3 Inactivity & agricultural work - no evidence
H3.3: Long-term inactivity is related to a lower probability of labour force participation in later life.	Type 1 Limited economic activities - no evidence	Type 1 Limited economic activities - no evidence	Type 9 Limited economic activities - support H3.3 Type 8 Agricultural work & inactivity - support H3.3	Type 5 Limited economic activities - support H3.3 Type 2 Agricultural work & inactivity - support H3.3
H3.4: For urban residents, work experiences of long-term Bianzhi employment have an impact on labour force participation which is different from work experiences of long-term ordinary employment.	Type 5 Long-term Bianzhi Employment - no evidence Type 6 Bianzhi employment with other early experiences - no evidence	Type 5 Long-term Bianzhi Employment - no evidence Type 6 Bianzhi employment with other early experiences - no evidence	No relevant trajectories	No relevant trajectories
H3.5: For rural residents, work experiences featuring having multiple jobs at the same time are related to a lower probability of labour force participation in later life.	No relevant trajectories	No relevant trajectories	Type 2 Long-term multiple work - no evidence Type 3 Agricultural work & multiple work - support H3.5 Type 4 Multiple work in middle years - no evidence	Type 4 Long-term multiple work - no evidence

Note: 1) Results in Tables 7.4 a) and b) are based on significance detected at any levels (at least 95%). The significance of individual and family characteristics in Model B3 is not reported as this study does not focus on the differences in significance between the older population and those older than 60; see Section 3.5.4 for details.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

The different associations of the two programmes largely explain the heterogeneity in labour force participation between living areas. The participants of the OPP can afford to leave the labour market with the receipt of pension benefits once approaching the SPA. In contrast, other residents (rural residents and a large number of flexible workers residing in urban area) may need to continue to work in advanced ages due to their insufficient financial resources, even if they have access to the Residents' Social Pension programme.

The gap in labour force participation due to the OPP indicates not only the strong incentives of leaving the labour market around the SPA due to the calculation method of pension benefits, but also the restrictions for working that individuals can experience upon approaching the SPA. In this sense, relevant policies on improved pension calculations and flexible retirement may improve the labour force participation rate of older adults in China. On the other hand, the benefit level of the RSPP needs to be further improved in the future to give rural residents the option of not working. This might especially be the case for the oldest-old group, who suffer from poor health status and lack the ability to work.

Second, the results in terms of family characteristics highlight the importance of intergenerational material transfers and care provision to grandchildren, which add depth to studies in the Chinese context as well as the wider literature.

The importance of marital status on labour force participation is confirmed, which is in accordance with existing literature (e.g. Szinovacz et al, 2001). Individuals who are married and having working spouses have a higher probability of labour force participation compared to individuals with of other marital status.

Concerning the intergenerational material transfers, rural residents who rely on transfer from children are less likely to work, which confirms their lower income levels and the lack of support of the RSPP. On the other hand, net providers amongst men are more likely to work, which reflect the heavier financial burden of middle-aged male compared to women.

The care provision to grandchildren has a much higher impact than care provision to parents. Such results may indicate that the contact between older adults and their parents is more likely to be an emotional need whereas care provision to grandchildren is intensive and makes a negative impact on the labour force participation of women.

In addition, results at the family level indicate the gender division in terms of family obligations, which is shown by the different impact of material transfers and care provision on labour force participation between men and women. Women are more likely to be responsible for care

provision and contribute their time to meet the needs of family members and are more likely to be influenced by the negative effect of care provision. On the other hand, men are more likely to be responsible for providing financial support to family members.

Lastly, results in this chapter reflect several associations between typical work trajectories and labour market outcomes in later life, which are innovative amongst existing literature in the Chinese context as well as the wider context. The main findings are summarised as two aspects. The first aspect is that respondents with work experiences in the informal sector have a much higher probability of labour force participation in later life compared to respondents working in the formal sector (H3.1). There are differences in the labour force participation in later life between groups with long-term agricultural work and with long-term non-agricultural work; such patterns exist in both urban and rural areas. Compared to agricultural work, work experiences in the formal sector are more likely to provide individuals with the access to the OPP and pension benefits in later life. On the other hand, the formal sector itself may set restrictions on continuing working in the previous positions after the SPA. Both aspects can lead to the relatively lower labour force participation of workers in the formal sector.

Within the formal sector, differences between *Bianzhi* and non-*Bianzhi* is not large (There is no evidence for H3.4). work trajectories of *Bianzhi* employment does not make an impact on the probability of labour force participation in later life. It is possible that our samples are restricted to those who are 60 and over. Or, the inequality between them are not distinguishable enough, neither.

H3.5 is also relevant to these associations, that respondents with the work trajectories of agricultural work & multiple jobs have a lower probability of working compared to long-term agricultural workers over the life course. These respondents are more likely to be migrant workers and have access to higher financial rewards or have a higher probability to get access to the occupational benefits, so that they are less likely to work than other rural residents.

The second aspect of association is that the impact of inactivity over the life course varies in terms of the length of inactivity. On the one hand, short interruptions or inactivity is related to a higher probability of labour force participation in later life. Experiences at another working sector at the beginning of career lives is related to a higher probability of labour force participation for urban men; respondents experienced mid-life career transformations are related to a higher probability of labour force participation in later life for both men and women (H3.2). In addition, the gender difference lies within the working years- urban men required more working years for pensions respondents with interruptions need work for additional years in later life.

On the other hand, longer inactivity for rural residents is related to a lower probability of labour force participation in late life. These longer periods of inactivity appear to indicate the attitudes towards work. Long-term inactivity and inactivity in late years after agricultural work are significant for rural residents but not urban residents (H3.3) - which can relate to work preferences. Such results reflect that they have more freedom in making labour market decisions; their long-term inactivity may reflect the lower priority and preferences for work.

Chapter 8 Results V: Factors influencing the labour market exit of older adults

8.1 Overview

Chapter 7 has investigated the correlates of the labour force participation of Chinese individuals in later life at different levels, including individual characteristics, family characteristics and work histories in the past. This chapter revisits these factors and investigates their impact on labour market exit in later life. Given that the characteristics are measured at baseline in 2011, prior to the observed labour market outcomes four years later in 2015, the results in this chapter indicate the causality between influencing factors and labour market behaviour compared to Chapter 7. Based on results in Chapter 7, this chapters provide us with further understanding of the power of these factors as the predictors for labour market outcomes in later life. Specifically, this chapter addresses RQ5: *What are the predictors of the labour market exit in later life and how can they explain the heterogeneity in labour market exit between different social groups?*

Analysis in this chapter is based on Sample B, which includes 9,312 respondents who were working in 2011. To investigate the predictors of labour market exit, Logistic Regression Models B1, B2 and B3 were developed sequentially. The binary outcome variable is whether experiencing labour market exit over the period (see Section 3.5.4). Specifically, Model B1 includes variables at the individual level (N=9,252). Model B2 further includes family characteristics as explanatory variables (N=8,747). Model B3 further includes indicators of work trajectories on the basis of significant individual and family characteristics in B2 (N=3,772). The study sample in Model B3 was restricted to individuals aged 60 and over (55 and over for urban women) for the investigation of the impact of the complete work trajectories in the past.

This chapter is arranged in a similar structure as Chapter 7. Sections 8.2 to 8.4 discuss the predictors of the transition into economically inactive status from different dimensions, including individual characteristics, family characteristics and typical work trajectories. Section 8.5 summarises the main findings in this chapter, and discusses how these findings further improve the understanding of the factors influencing the labour market behaviour in alter life on the basis of results in Chapter 7.

8.2 Individual characteristics as the predictors of the labour market exit

This section investigates the association between labour market exit and Individual characteristics, including age, health status, SES and receipt of pension benefits. Based on the existing literature and findings from previous chapters, the author lists four hypotheses on their association with labour market exit as below:

H4.1 The Increasing age is related to a higher probability of labour market exit in later life.

H4.2 Poor health status is related to a higher probability of labour market exit in later life.

H4.3 Better SES is related to a higher probability of labour market exit in later life.

H4.4 The Receipt of pensions from the Occupational Pension Programme and the Residents' Social Pension Programme is related a higher probability of labour market exit in later life.

Regarding H4.1, the author expects that increasing age is a related to a higher probability of labour market exit, which is similar to the findings in Chapter 7. At the same time, the SPA of the OPP may make an impact on the transition into economically inactive status of urban residents. Again, age group (at Wave 1, year 2011) is used as the indicator to test the age effect.

Regarding H4.2, the results in Chapter 7 have shown that the prevalence of IADL (and ADL) difficulties and chronic illnesses is related to a lower probability of labour force participation cross-sectionally. This chapter analyses the association between the changes in health status and the labour market exit in the subsequent four years. Based on findings in Chapter 7, the impact of chronic illnesses is expected to be smaller than IADL difficulties as the restrictions they set on health status may be less relevant to the ability to work.

Regarding H4.3, the results in Chapter 7 have shown that the impact of educational attainment, housing tenure and house ownership is small but significant amongst rural residents. This chapter analyses their impact on the labour market exit. SES at the beginning of period is used as variables since focus is given to the long-term factor of financial status on labour market behaviour which is reflected by SES.

Regarding H4.4, the results in Chapter 7 have shown receiving pension benefits from the OPP makes sense but not the RSPP does not have a significant impact on labour force participation. This chapter investigates their impact on labour market exit. For both pension programmes, a dummy variable indicating the receipt of pensions in 2011 and a categorical variable of the changes over the four years presenting the changes in pension entitlements are used in Model B series.

To test these hypotheses on the predictors of labour market exit in later life, Model B1 was developed. Table 8.1 reports the ORs and p-values of explanatory variables at the individual level. Compared to the results of Model A1 in Chapter 7, most individual characteristics in Model B1 are significant again, although there are some minor differences in the coefficients of ORs. These results mean that these individual characteristics are critical to the labour market exit of older adults as well.

First, the impact of age on labour market exit is differentiated across the four subgroups. For urban men, respondents from higher age groups have a higher probability of labour market exit than the reference group, except the 50-54 age group (ORs=3.54, 5.35, 3.52 and 6.89, $p<0.001$). The OR of the 60-64 age group is larger than the other two adjacent groups (55-59 and 65-69), indicating that reaching the SPA has a decisive impact on the decision of labour market exit. The results for urban residents show that reaching the SPA and advanced ages (possibly related to deteriorated health) are important for urban men. For urban women, only respondents aged 70 and above experienced a higher probability of leaving the labour market (OR=12.18, $p<0.05$). It is likely that the probability of leaving the labour market for urban women aged 45 to 64 is similarly high, so that only 70+ makes a difference in terms of ORs. For rural men, increasing age results in higher probabilities of leaving the labour market (OR=1.71, 2.16, 2.9, 4.87 and 12.18, $p<0.001$). For rural women, the association is similar but is only significant for respondents aged 60 and over (OR=1.44, 2.05 and 4.7, $p<0.05$, $p<0.001$ and $p<0.001$). For rural residents, it is similar to urban residents that older age groups have larger ORs, and no effect of the SPA are observed. To summarise, the higher probability of leaving the labour market due to increasing age is confirmed across the four subgroups; in addition, the probability of leaving the labour market is also relatively high around the SPA.

Second, the negative impact of health status is much more pronounced amongst rural residents. Concerning the prevalence of IADL difficulties, the prevalence of any IADL difficulties in 2011 is not significant amongst urban residents. The changes in health status over the four years are significantly related to the probability of labour market exit for only urban men – urban men who reported deteriorated health status experienced a higher probability of leaving the labour market (OR=2.20, $p<0.05$). For rural residents, changes in IADL difficulties as well as the health status in 2011 are significant – whether deterioration or improvement over the period is significantly related to the probability of leaving the labour market (OR=2.64, 1.77, 0.22, 0.52, $p<0.001$, $p<0.001$, $p<0.001$ and $p<0.01$). The alternative indicator, ADL difficulties, reflect a very similar association (see Table A.10). According to these results, health status is critical to labour force participation but becomes a less important factor here for the labour market exit of urban residents over the four-year period. Regarding chronic illnesses, there is no evidence for the

association between chronic illnesses and the transition into economically inactive status, except a weak association amongst rural men and women (ORs=1.26, $p<0.05$). These results are consistent with findings in Chapter 7 that chronic illnesses are less important in the decision of labour market outcomes than the prevalence of IADL difficulties.

Third, regarding H4.3, SES appears to be a less important factors in shaping the labour market exit; these results confirm the complex meaning of SES indicators, which is consistent with findings in Chapter 7. The impact of educational attainment and house ownership on leaving the labour market over the four years is not significant. The relationship between quintiles of household expenditure per capita and labour market exit is significant but is limited to one category for urban and rural men respectively (ORs=1.86 and 1.46, $p<0.05$ and $p<0.01$), but the relationship is not clear. Considering these results, they may not be critical factors on the decision of transition into economically inactive status over a relatively short period.

Lastly, within the financial resources pension benefits are still sig, which confirms H4.4. Receiving pensions from the OPP in 2011 is important in explaining the transition into economically inactive status of urban residents (ORs=1.84 and 2.55, $p<0.01$). Starting to receive pensions is related to even higher ORs for urban residents (ORs=3.13 and 2.67, $p<0.001$). Both indicators confirm that pensions are related to better financial status and a higher probability of labour market exit. On the other hand, the impact of the Residents' Social Pension Programme is not significant in any subgroups, which is very similar to results in Chapter 7, that this programme does not make sense, possibly due to its small values.

Table 8.1 Model B1: Odds ratios of the transition into economically inactive status over the four-year period from 2011 to 2015 (Sample B)

VARIABLES	B1.1 Urban men	B1.2 Urban women	B1.3 Rural men	B1.4 Rural women
Age group (Reference group: 45-49)				
50-54	1.27 (0.576 - 2.801)	1.00 (0.497 - 2.025)	1.71** (1.153 - 2.546)	1.23 (0.952 - 1.594)
55-59	3.49*** (1.693 - 7.209)	1.15 (0.526 - 2.495)	2.13*** (1.458 - 3.110)	1.16 (0.892 - 1.516)
60-64	5.33*** (2.244 - 12.644)	1.72 (0.660 - 4.488)	2.92*** (1.937 - 4.394)	1.45* (1.080 - 1.955)
65-69	3.48** (1.373 - 8.846)	2.79 (0.859 - 9.056)	4.90*** (3.193 - 7.504)	2.09*** (1.507 - 2.885)
70+	6.09*** (2.117 - 17.524)	14.31* (1.284 - 159.546)	12.14*** (7.902 - 18.655)	4.78*** (3.370 - 6.793)
Have any IADL difficulties in 2011	0.73 (0.178 - 2.985)	1.03 (0.262 - 4.035)	3.18*** (2.207 - 4.581)	2.27*** (1.763 - 2.922)
Changes in IADL difficulties (Ref. group: No change)				
Deteriorate	2.20* (1.040 - 4.644)	1.03 (0.395 - 2.682)	2.66*** (2.073 - 3.423)	1.79*** (1.464 - 2.188)
Improve	0.70 (0.132 - 3.735)	0.42 (0.074 - 2.403)	0.35*** (0.223 - 0.560)	0.55*** (0.405 - 0.752)
Have any chronic illnesses in 2011	1.12 (0.682 - 1.854)	1.03 (0.569 - 1.848)	1.14 (0.902 - 1.453)	1.26* (1.027 - 1.555)
Begin to have chronic illnesses	1.31 (0.602 - 2.843)	1.89 (0.829 - 4.328)	1.23 (0.883 - 1.701)	1.17 (0.870 - 1.573)
Educational attainment (Ref. group: No formal education)				
Did not finish primary school	1.18 (0.362 - 3.830)	1.21 (0.427 - 3.408)	1.18 (0.869 - 1.593)	0.91 (0.741 - 1.122)
Finish primary school	0.86 (0.280 - 2.650)	0.50 (0.183 - 1.365)	1.31 (0.976 - 1.749)	1.00 (0.804 - 1.253)
Finish middle school	1.20 (0.409 - 3.499)	0.86 (0.338 - 2.180)	1.39* (1.005 - 1.913)	1.11 (0.851 - 1.445)
High school or above	0.92 (0.315 - 2.677)	0.66 (0.252 - 1.734)	1.35 (0.877 - 2.073)	0.86 (0.523 - 1.415)
No house ownership	1.40 (0.750 - 2.623)	0.77 (0.372 - 1.577)	0.99 (0.753 - 1.293)	0.90 (0.710 - 1.149)
Quintile of household expenditure per capita (Ref. group: Lowest 20%)				
60%-80%	0.99 (0.570 - 1.733)	0.70 (0.342 - 1.437)	1.04 (0.780 - 1.395)	1.02 (0.811 - 1.277)
40%-60%	1.86* (1.038 - 3.329)	0.89 (0.434 - 1.831)	1.09 (0.808 - 1.457)	0.85 (0.670 - 1.073)
20%-40%	1.45 (0.764 - 2.742)	1.02 (0.476 - 2.163)	1.46** (1.095 - 1.936)	0.87 (0.685 - 1.104)
Top 20%	1.37 (0.701 - 2.661)	1.00 (0.443 - 2.250)	1.27 (0.941 - 1.723)	0.95 (0.743 - 1.214)
Receipt of the Occupational Pensions in 2011	1.97* (1.061 - 3.642)	2.43* (1.203 - 4.906)	1.63 (0.966 - 2.736)	2.21 (0.918 - 5.324)
Begin to receive the Occupational Pensions	3.32*** (1.819 - 6.049)	2.54** (1.357 - 4.739)	1.94** (1.199 - 3.123)	1.33 (0.741 - 2.391)
Receipt of Residents' Social Pensions in 2011	1.30 (0.558 - 3.050)	1.83 (0.624 - 5.357)	1.04 (0.769 - 1.413)	1.12 (0.850 - 1.466)
Begin to receive Residents' Social Pensions	0.48 (0.192 - 1.181)	0.82 (0.369 - 1.815)	0.94 (0.738 - 1.200)	1.08 (0.876 - 1.338)
Region (Ref. group: Eastern)				
Central	0.88 (0.545 - 1.421)	0.80 (0.444 - 1.441)	1.24 (0.985 - 1.554)	0.78* (0.643 - 0.943)
Western	1.08 (0.660 - 1.772)	0.85 (0.454 - 1.589)	0.95 (0.760 - 1.197)	0.72*** (0.601 - 0.867)
Pseudo R-square	0.161	0.093	0.122	0.060
Observations	635	342	4,176	4,099

Note: 1) The star symbols indicate the p-values for ORs, where *** represents p<0.001, ** represents p<0.01, * represents p<0.05. 2) The 95% confidence intervals for ORs are reported in brackets.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) and Wave 3 (2015).

8.3 Family characteristics as the predictors of labour market exit

This section investigates the impact of family characteristics on labour market exit over the four-year period. The research focus of this section include the impact of marital status, the intergenerational transfers with other family members and the care provision (to grandchildren and parents). Based on the existing literature and findings from previous chapters, the author lists three hypotheses on their association with labour market exit as below:

H5.1 In terms of marital status, respondents with working spouses have the lowest probability of labour force exit over the period from 2011 to 2015 compared to other groups.

H5.2 Material transfers from family members is related to a higher probability of labour market exit; by contrast, material transfers to family members is related to a lower probability of labour market exit.

H5.3 Care provision to family members is related to a higher probability of labour market exit.

Concerning H5.1, the impact of marital status and the propensity towards joint retirement of couples is supported by the cross-sectional data in Chapter 7. The author further examines whether the impact of spouses is significant for labour market exit over a relatively short period. Since the marital status (and working status of spouses) are time-variant, marital status in 2011 and changes in marital status over the four years are included in Models B1, B2 and B3 at the same time.

Concerning H5.2, the impact of intergenerational material transfers has been found to be significant in the cross-sectional analysis. Give the importance of financial resources at the family dimension, this chapter analyses whether intergenerational material transfers are an important predictor of the decision of labour market exit. Material transfers is treated as a time-invariant variable in Models B2 and B3.

For H5.3, Chapter 7 has shown that care provision to grandchildren and parents have different meanings to the labour market decisions of individuals. The care provision to grandchildren in 2011 and the changes in the intensity of care provision to grandchildren are used as the indicator for the care provision to grandchildren. Whether having any surviving parents is used as proxies for care provision to parents since relevant data for year 2015 is not available (see Section 3.6).

In order to test these hypotheses, Model B2 was developed. Model B2 includes seven indicators of family characteristics as well as individual characteristics in Model B1 as control variables. Table 8.2 reports the ORs and p-values of explanatory variables at the family level (see Table A.13 for full results). Compared to the results of Model B1, most individual factors are still significant,

which means both individual and family characteristics are important predictors of the labour market exit in later life. In terms of family characteristics, marital status and care provision to grandchildren are significant indicators; the financial consideration at the family level (material transfers) is less powerful for the transition into economically inactive status over the four years.

Marital status is shown to be important in shaping the labour market exit over the four years, which confirms H5.1. On the one hand, the propensity of joint retirement is confirmed. Compared to the reference category (married respondents with working spouses), married respondents with economically inactive spouses are more likely to leave the labour market over the period; such association is significant amongst both urban and rural residents (ORs=5.67, 3.08, 3.30 and 2.17, $p<0.001$). The changes in marital status reflects a similar association. Respondent with spouses leaving work over the four years had a higher probability of labour market exit (ORs=5.11,4.07,3.74 and 3.51; $p<0.001$, $p<0.01$, $p<0.001$, and $p<0.001$). Spouses began to work over the four year is only significant amongst rural residents. This may indicate rural residents are more likely to work again/more flexibility in their work/make decisions as family unit rather than the pension system.

On the other hand, the widowed respondents, which account for the second largest group, have a much higher probability of leaving the labour market over the period. The widowed group is related to a significantly higher probability of labour market exit amongst urban men, rural men and rural women (ORs=7.56, 4.36 and 2.31, $p<0.001$). These results show that couples may highly rely on each other's income and be affected by becoming widowed. In addition, the widowed group may have a new family and living arrangement, which also makes an impact on labour market decisions in later life.

Second, the impact of material transfers with family members on labour market exit is limited. The variable is only significant amongst urban women, where the group of net providers is related to a significantly lower probability of labour market exit (OR=0.35, $p<0.01$). This group is more likely to work as they provide additional transfer to children; however, such results can be less representative as only apply to a very small group since the size of this group amongst urban women is quite small. Similar to the case of SES, material transfers with family members is related to the financial status of respondents but is not critical to the labour market decision during a relatively short period.

Table 8.2 Model B2: Odds ratios of the transition into economically inactive status over the four-year period from 2011 to 2015 (Sample B)

VARIABLES	B2.1 Urban men	B2.2 Urban women	B2.3 Rural men	B2.4 Rural women
Marital status in 2011				
(Ref. group: Married, spouses working)				
Married, spouses not working	5.78***	2.46*	3.34***	2.25***
	(3.172 - 10.536)	(1.001 - 6.047)	(2.526 - 4.410)	(1.665 - 3.033)
Widowed	7.56**	0.56	4.36***	2.31***
	(1.724 - 33.181)	(0.183 - 1.707)	(3.011 - 6.322)	(1.770 - 3.016)
Changes in marital status				
(Ref. group: No change)				
Spouses left work	5.55***	3.97**	3.77***	3.58***
	(2.881 - 10.699)	(1.594 - 9.868)	(2.934 - 4.856)	(2.813 - 4.548)
Spouses began to work	0.61	0.35	0.30***	0.34**
	(0.273 - 1.373)	(0.093 - 1.328)	(0.174 - 0.503)	(0.178 - 0.646)
Become widowed	2.10	1.54	1.73	1.63**
	(0.286 - 15.373)	(0.258 - 9.117)	(0.993 - 3.015)	(1.153 - 2.304)
Intergenerational transfer				
(Ref. No transfer or both directions)				
Net recipient	0.61	0.65	1.13	1.04
	(0.300 - 1.257)	(0.238 - 1.797)	(0.898 - 1.423)	(0.849 - 1.264)
Net provider	1.01	0.35**	0.96	1.06
	(0.572 - 1.790)	(0.185 - 0.675)	(0.699 - 1.323)	(0.833 - 1.348)
Care provision to grandchildren in 2011				
(Ref. group: No care provision)				
Care provision to grandchildren: 0-10H/W	1.74	2.17	1.27	1.18
	(0.653 - 4.656)	(0.643 - 7.330)	(0.862 - 1.880)	(0.851 - 1.631)
Care provision to grandchildren: 10-20H/W	0.57	1.09	1.04	1.30
	(0.090 - 3.632)	(0.046 - 25.874)	(0.586 - 1.847)	(0.845 - 2.006)
Care provision to grandchildren: 20+H/W	1.49	1.10	0.99	1.20
	(0.758 - 2.928)	(0.425 - 2.856)	(0.732 - 1.326)	(0.949 - 1.522)
Changes in care provision to grandchildren				
(Ref. group: No change)				
Stop care provision to grandchildren	0.31	0.79	1.28	0.86
	(0.126 - 1.760)	(0.214 - 2.912)	(0.925 - 1.772)	(0.643 - 1.149)
Start care provision to grandchildren	0.97	2.08*	1.02	1.55***
	(0.531 - 1.755)	(1.024 - 4.232)	(0.764 - 1.357)	(1.258 - 1.912)
Care provision to parents in 2011	0.52*	1.59	0.85	1.12
(any surviving parents in 2011)	(0.290 - 0.936)	(0.779 - 3.261)	(0.646 - 1.124)	(0.895 - 1.394)
Stop care provision to parents	2.39*	1.10	1.10	0.79
(no surviving parents in 2015)	(1.094 - 5.233)	(0.405 - 2.974)	(0.773 - 1.571)	(0.594 - 1.060)
Region				
(Ref. group: Eastern)				
Central	1.08	0.85	1.29*	0.72**
	(0.623 - 1.867)	(0.430 - 1.700)	(1.004 - 1.649)	(0.587 - 0.879)
Western	1.17	1.07	1.03	0.67***
	(0.659 - 2.087)	(0.508 - 2.254)	(0.804 - 1.319)	(0.549 - 0.811)
Pseudo R-square	0.260	0.164	0.181	0.100
Observations	597	297	3,930	3,923

Note: 1) The star symbols indicate the p-values for ORs, where *** represents p<0.001, ** represents p<0.01, * represents p<0.05. 2) The 95% confidence intervals for ORs are reported in brackets.
3) Respondents who reported to be never married are removed from the models for better interpretations of the models (less than 1%). 4) The results of individual characteristics are not reported; see Table A.14 for full results.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) and Wave 3 (2015).

Lastly, the care provision to grandchildren and to parents have different impact on labour market exit. The category of 'staring to care grandchildren over the four years' is related to a higher probability of labour market exit for urban and rural women, which confirms the gender differences in terms of care provision as discussed in Chapter 7 (OR=2.08 and 1.55, $p<0.5$ and $p<0.001$). On the other hand, there is no evidence on the association between having any alive parents and the transition into economically inactive status.

8.4 Labour market exit and the impact of work histories

This section discusses the impact of different work pathways over the life course on the labour market exit in later life. The author lists five hypotheses on their potential association based on existing literature as well as findings in previous chapters. All of them are related the typology of work trajectories from sequence analysis in Chapter 6.

H6.1 Compared to long-term work experiences in the formal sector, long-term work experiences in the informal sector are related to a lower probability of labour market exit in later life.

H6.2 Interruptions of work histories are related to a lower probability of labour market exit in later life.

H6.3 Long-term inactivity is related to a higher probability of labour market exit in later life.

H6.4 For urban residents, work experiences of long-term Bianzhi employment have an impact on labour market exit which is different from work experiences of long-term ordinary employment.

H6.5 For rural residents, work experiences featuring having multiple jobs at the same time are related to a higher probability of labour force exit in later life.

Regarding H6.1, the author the work experiences in the formal and informal sectors make a different impact on the labour market exit in later life, which has been found in Chapter 7. Since work experiences in the informal sector indicate less attachment to the OPP and available financial resources in later life, respondents with such experiences may be more likely to work to support themselves.

Regarding H6.2, interrupted work histories are expected to be associated with a lower probability of labour market exit, since inactivity or work changes to another working sector cause a loss in the accumulation of occupational pensions.

Regarding H6.3, long-term inactivity is expected to be related to a higher probability of labour market exit since respondents with such work trajectories reflect their propensity of working is

low. Results in Chapter 7 show that such association is only significant amongst rural residents; this chapter investigates whether such association exists for labour market exit; as their work propensity is low, those who are still in the labour market should be more likely to leave the labour market.

Regarding H6.4, the impact of long-term *Bianzhi* employment and long-term ordinary employment on labour market exit in later life is examined as employees with Bianzhi experiences are privileged in terms of the eligibility of the pensions. Although such association is not found in Chapter 7, the expected association between labour market outcome and *Bianzhi* employment is investigated again in this chapter in order to confirm whether the difference between sectors do not make a difference to older adults above the SPA.

Regarding H6.5, work experiences of multiple jobs at the same time is related to a higher probability of labour market exit in later life. Having multiple jobs at the same time is likely to be the typical work behaviour of migrant workers; compared to the reference group (long-term agricultural workers), migrant workers have better financial status and are more likely to afford inactivity. Thus, the probability of leaving the labour market of this group is expected higher.

Model B3 was developed in order to test these hypotheses on the impact of work histories. Model B3 includes the variable of work typology as explanatory variable and all significant variables in Model B2 as control variables. The variable of work typology is the same as the one used in Model A3, Table 8.3 reports the ORs and p-values for different work trajectories in Model B3 (see Table A.14 for full results); long-term ordinary employment and long-term agricultural work are the reference group for ORs. According to Table 8.3, supportive evidence for most of hypotheses is limited, which is probably due to the short observation period of the transition into economically inactive status. However, the difference in labour market exit between formal and informal sector is highly significant (H6.1), indicating its importance.

Table 8.3 Model B3: Odds ratios of the transition into economically inactive status over the four-year period from 2011 to 2015 by typical work trajectory (Sample B, urban women aged 55 and over, other groups aged 60 and over)

VARIABLES	B3.1 Urban men
(Ref. group: Type 7 Long-term ordinary employment)	
Type 1 Limited economic activities	0.67 (0.176 - 2.527)
Type 2 Long-term agricultural work	0.36* (0.118 - 0.976)
Type 3 Long-term multiple jobs	0.29 (0.056 - 1.453)
Type 4 Long-term self-employment	0.80 (0.201 - 3.179)
Type 5 Long-term *Bianzhi* employment	0.74 (0.363 - 1.512)
Type 6 *Bianzhi* employment with Other early experiences	0.82 (0.309 - 2.169)
Type 8 Ordinary employment with other early experiences	1.00 (0.299 - 3.341)
Type 9 Mid-life career transformation	0.73 (0.267 - 1.981)
Pseudo R-square	0.220
Observations	228

VARIABLES	B3.2 Urban women
(Ref. group: Type 7 Long-term ordinary employment)	
Type 1 Limited economic activities	0.29 (0.080 - 1.020)
Type 2 Long-term agricultural work	0.31* (0.113 - 0.825)
Type 3 Agricultural work & ordinary employment	0.70 (0.197 - 2.485)
Type 4 Long-term self-employment	0.80 (0.205 - 3.125)
Type 5 Long-term *Bianzhi* employment	1.07 (0.199 - 5.714)
Type 6 *Bianzhi* employment with other early experiences	0.27 (0.025 - 2.902)
Type 8 Ordinary employment with other early experiences	0.80 (0.205 - 3.125)
Type 9 Mid-life career transformation	0.16 (0.016 - 1.560)
Pseudo R-square	0.337
Observations	149

VARIABLES	B3.3 Rural men
(Ref. group: Type 1 Long-term agricultural work)	
Type 2 Long-term multiple jobs	0.96 (0.589 - 1.572)
Type 3 Agricultural work & multiple work	2.14** (1.298 - 3.543)
Type 4 Multiple jobs in middle years	0.88 (0.470 - 1.638)
Type 5 Long-term employment	1.50 (0.854 - 2.639)
Type 6 Ordinary employment & Agricultural work	1.89 (0.999 - 3.570)
Type 7 Long-term self-employment	1.66 (0.744 - 3.685)
Type 8 Agricultural work & inactivity	0.58 (0.255 - 1.341)
Type 9 Limited economic activities	0.63 (0.293 - 1.368)
Pseudo R-square	0.163
Observations	1,778

VARIABLES	B3.4 Rural women
(Ref. group: Type 1 Long-term agricultural work)	
Type 2 Agricultural work with later inactivity	2.29** (1.267 - 4.130)
Type 3 Inactivity & agricultural work	1.23 (0.481 - 3.146)
Type 4 Long-term multiple jobs	0.89 (0.402 - 1.955)
Type 5 Limited economic activities	1.72* (1.120 - 2.650)
Type 6 Long-term self-employment	1.19 (0.311 - 4.570)
Type 7 Long-term employment	0.32 (0.069 - 1.538)
Pseudo R-square	0.114
Observations	1,617

Note: 1) The star symbols indicate the p-value for ORs, where *** represents p<0.001, ** represents p<0.01, * represents p<0.05. 2) The 95% confidence intervals for ORs are reported in brackets. 3) The results of individual and family characteristics are not reported; see Table A.14 for full results.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) and Wave 3 (2015).

Regarding H6.1, for urban residents, only the work trajectories of 'Type 2 Long-term agricultural work' is found to be related to a significant lower probability of labour market exit (ORs=0.36 and 0.31, p<0.05), which partly supports H3.1. The other two work trajectories that are relevant to the informal sector and H3.1 do not make a significant impact on labour market exit (i.e. 'Type 3 multiple jobs at the same time' and 'Type 4 Long-term self-employment'). For rural residents, work experiences related to the formal sector are not related to a higher probability of labour market exit. These results indicate that the nature of agricultural work is different from other economic activities for urban residents and is related to a low probability of engagement in the formal sector and receiving occupational pension benefits. The other work trajectories (self-employment and multiple jobs at the same time) are not distinct enough when compared with the reference group.

Regarding H6.2, the results of Model B3 do not provide supportive evidence on the impact of interruptions of work histories. None of relevant indicators are significantly related to the labour market exit in later life. While findings in Chapter 7 generally support H3.2 on the association between interruptions of work and a higher probability of working in later life (either 'other work experiences early years' or 'mid-life transformations'), it appears the impact of early interruptions of work are less critical for the transition into economically inactive status over a short period.

Regarding H6.3, the effect of long-term inactivity is confirmed amongst rural women. For rural women, Type 2 'Long-term inactivity' and Type 5 'Agricultural work & inactivity in later life' are found to be significantly related to a higher probability of labour market exit. Results here indicate rural women are more likely to realise their plans and preferences on the timing of the labour market.

Regarding H6.4, no difference on the impact of *Bianzhi* employment compared to long-term employment is found. Results here are consistent with findings in Chapter 7. Again, the reason might be similar that *Bianzhi* employment does not make an impact on labour market exit above the SPA, or its impact is offset by the SPA of the public pension programmes.

Regarding H6.5, the impact of work trajectories of multiple jobs on labour market exit is found amongst rural men of Type 3 'Early agricultural work and later multiple jobs'. The other two categories (Types 2 and 4) are not significant. Rural women of Type 3 are not sig. neither. The significance of indicators is exactly the same as results in Chapter 7, which may support the thoughts in Chapter 7 that only multiple jobs in recent years indicate migrant workers, who are likely to experience different things.

To summarise, the indicators that distinguish the work experiences between the formal and informal sectors are significant predictors of labour market exit in Model B3. First, the comparison between Individual with long-term agricultural work and individual work experiences in the formal sector show the distinction between formal and informal sectors amongst urban residents. Second, work trajectories of multiple jobs holders are related to a higher probability of labour market exit, which reflect the different work preferences of migrant workers from rural residents. Lastly, rural women with long-term inactivity are less likely to stay in the labour market in the later life, which reflect their realisation of labour market exit is in accordance with their work preferences.

8.5 Chapter summary

This chapter presents new analysis concerning the predictors of the labour market exit in later life in China. Using longitudinal data over a four-year period, this chapter focuses on how individual characteristics, family characteristics and work experiences may make an impact on the labour market exit over a period, and discusses how they further improve our understanding of the labour market behaviour of older adults in China based on the cross-sectional analysis in Chapter 7. The results in this chapter show that most correlates of labour force participation presented in Chapter 7 are significant predictors of labour market exit as well. Not all correlates of labour force participation in 2013 are important predictors for the decisions of labour market exit from 2011 to 2015, possibly due to the short observation period and the fact that labour market exit is a rare event that related to a relatively small number of samples. To review the main findings in this chapter, Table 8.4 summarises the significance of explanatory variables in the Model B series.

At the individual level, the impact of age, health status and receipt of the Occupational Pensions is found to be large, which is similar to findings in Chapter 7. The association between SES indicators and labour market exit become even less significant.

Results show that the increasing age is related to a higher probability of labour market exit, which confirms H4.1. The differences in the ORs across ages group amongst urban women are much smaller, which indicate the probability of leaving of older women is similarly high. In addition, the ORs come to a peak around the 60-64 age group for urban men, which indicate the impact of the SPA of the OPP.

In terms of health status, while the expected association in H4.2 is found, the impact is smaller than results in Chapter 7, especially in urban areas. The impact of IADL difficulties are more limited; only the deterioration of health status makes an impact; status in 2011 and the improvement of health status are not significant. These results mean that health status become a less important factor for labour market exit compared to results in Chapter 7; other factors can be more critical (such as the receipt of pensions).

In terms of SES indicators, SES of individuals does not make impact on the labour market behaviour over a short period in general, which is different from the work of Giles (2011) using the CHARLS. These results indicate the SES not only measures the level of available financial resources but also have more complex meanings. It is likely that SES are more likely to indicate the long-term financial status of individuals, which may not have an impact on work decisions over a short term period.

The receipt of the occupational pensions remains to be one of the most important factors at the individual level. Pension benefits is one of the most important financial resources for older adults. On the other hand, Residents' Social pension is less supportive in terms of its lower benefit levels. Apart from the low benefits levels of the programme, most of eligible participants began to receive benefits from the programme automatically at age 60, which does not lead to selectivity of receiving pension benefits from this programme.

At the family level, marital status and care provision to grandchildren are shown to be important factors of labour market exit. In terms of the impact of marital status (H5.1), married respondents with working spouses are found to have the lowest probability of leaving the labour market. Compared to this group, married respondents with non-working spouses and the widowed groups are much more likely to leave the labour market. Results confirm the importance of marital status and the impact of spouses.

In terms of the impact of material transfers between family members (H5.2), while descriptive analysis in this thesis shows that intergenerational transfer account for a moderate proportion of financial income for rural residents, its impact on labour market exit is not significant. Similar to Chapter 7, the potential explanation might be that intergenerational material transfers are not as stable as pension income and labour income and cannot substitute those income types.

In terms of the impact of care provision to family members (H5.3), results in consistent with findings in Chapter 7. Care provision to grandchildren is related to a higher probability of leaving the labour market for women in both urban and rural areas. On the other hand, care provision to parents does not make an impact on labour market decisions in later life.

Lastly, the impact of work trajectories is less significant compared to results in Chapter 7; only the distinction between work experiences in the formal and informal sectors remains to be a significant predictor of labour market decisions in later life. Agricultural work is related to less attachment to the formal sector and pension benefits and thus can lead to a much lower probability of labour market exit over a relatively short period. On the other hand, the work experiences of agricultural work with multiple jobs in later life, to a great extent, indicate employment as migrant workers and better financial status than typical agricultural workers, which is related to a much higher probability of labour market exit. These results indicate the importance of analysing wealth accumulation over the life course that is relevant to the work trajectories and attachment to the public pension system in affecting labour market exit in later life, which may not be fully captured by the proximate indicators around the labour market decisions (such as SES).

Table 8.4 Summary of statistically significant variables in Model B series

a) the impact of individual and family characteristics, Models B1 and B2

	Model B1				Model B2			
	Urban men	Urban women	Rural men	Rural women	Urban men	Urban women	Rural men	Rural women
Individual characteristics								
Age cohort	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Have any IADL difficulties in 2011	No	No	Yes	Yes	No	No	Yes	Yes
Changes in IADL difficulties	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Have any chronic illnesses in 2011	No	No	No	Yes	No	No	Yes	Yes
Begin to have any chronic illnesses	No	No	No	No	No	No	No	No
Educational attainment	No	No	Yes	No	No	No	Yes	No
House ownership	Yes	No	Yes	No	No	No	No	No
Household expenditure per capita	Yes	No	No	No	No	No	No	No
Receive the Occupational Pension in 2011	Yes	Yes	No	No	Yes	Yes	No	No
Begin to receive occupational pensions	Yes	Yes	Yes	No	Yes	No	Yes	No
Receive the Residents' Social Pension in 2011	No	No	No	No	No	No	No	No
Begin to receive the Residents' Social	No	No	No	No	No	No	No	No
Family characteristics								
Marital status & spouses working					Yes	Yes	Yes	Yes
Changes in marital status					Yes	Yes	Yes	Yes
Intergenerational transfer					No	Yes	No	No
Care provision to grandchildren					No	No	No	No
Changes in care provision to grandchildren					No	Yes	No	Yes
Have any surviving parents in 2011					Yes	No	No	No
Changes in surviving parents					Yes	No	No	No

b) the impact of work histories, Model B3

Hypothesis	Urban men	Urban women	Rural men	Rural women
H6.1 Compared to long-term work experiences in the formal sector, long-term work experiences in the informal sector are related to a lower probability of labour market exit in later life.	Type 2 Long-term agricultural work - support H6.1 Type 3 Long-term multiple work - no evidence Type 4 Long-term self-employment - no evidence	Type 2 Long-term agricultural work - support H3.1 Type 3 Agricultural work & ordinary employment - no evidence Type 4 Long-term self-employment - no evidence	Type 5 Long-term employment - no evidence Type 6 Ordinary employment & agricultural work - no evidence Type 7 Long-term self-employment -no evidence	Type 6 Long-term self-employment - no evidence Type 7 Long-term employment - no evidence
H3.2 Interruptions of work histories are related to a higher probability of labour force participation in later life.	Type 8 Ordinary employment with other early experiences - no evidence Type 9 Mid-life career transformation - no evidence	Type 8 Ordinary employment with other early experiences - no evidence Type 9 Mid-life career transformation - no evidence	Not applicable	Type 3 Inactivity & agricultural work - no evidence
H6.3 Long-term inactivity is related to a higher probability of labour market exit in later life.	Type 1 Limited economic activities - no evidence	Type 1 Limited economic activities - no evidence	Type 8 Agricultural work & inactivity - no evidence Type 9 Limited economic activities -no evidence	Type 2 Agricultural work & inactivity - support H6.3 Type 5 Limited economic activities - support H6.3
H6.4 For urban residents, work experiences of long-term Bianzhi employment have an impact on labour market exit which is different from work experiences of long-term ordinary employment.	Type 5 Long-term Bianzhi Employment - no evidence Type 6 Bianzhi employment with other early experiences - no evidence	Type 5 Long-term Bianzhi Employment - no evidence Type 6 Bianzhi employment with other early experiences - no evidence	No relevant trajectories	No relevant trajectories
H6.5 For rural residents, work experiences featuring having multiple jobs at the same time are related to a higher probability of labour force exit in later life.	No relevant trajectories	No relevant trajectories	Type 2 Long-term multiple work - no evidence Type 3 Agricultural work & multiple work - support H6.5 Type 4 Multiple work in middle years - no evidence	Type 4 Long-term multiple work - no evidence

Note: 1) Results in Tables 8.4 a) and b) are based on significance detected at any levels (at least 95%). 2) The significance of individual and family characteristics in Model B3 is not reported as this study does not focus on the differences in significance between the older population and those older than 60; see Section 3.5.4 for details.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) and Wave 3 (2015).

Chapter 9 Discussion and conclusion

9.1 Overview

This chapter synthesises and discusses the empirical results presented in this thesis. This chapter begins by revisiting the overarching research aim and research questions of this thesis (Section 9.2) with a focus on the timeliness and importance of this study. In the following Sections 9.3 and 9.4, the author outlines the findings on the labour market behaviour of older adults in China from the univariate, bivariate and multivariate analysis conducted in this study and then discusses how the empirical results address the research questions. Section 9.5 discusses the policy implications of the findings concerning the public pension system, the family support policies and, more broadly, the ageing agenda as the overarching framework for improving the labour force participation of older adults. Section 9.6 discusses the potential methodological limitations of the study in terms of the study subjects. Finally, Section 9.7 identifies future research that, on the basis of the findings in this thesis, could contribute to the wider literature.

9.2 Revisiting the research aim and research questions of this thesis

The population ageing process in China has been one of the most remarkable demographic transformations in the past several decades. The resultant changes in the population structure of the labour market have raised concerns about the viability of the public pension system. According to the existing literature (Benjamin *et al.*, 2003; Pang *et al*., 2004; Zhang *et al.*, 2014; Giles *et al.*, 2015), inequalities in the labour market are recognised as presenting a major impediment to extending the working lives of older adults in China as part of any proposed reforms of the public pension system. Moreover, the increase in the life expectancy and the size of the older age group calls for a better understanding of the older population, not only in terms of making better use of the human resources of older workers but also to improve their well-being as they are important members of the society. Thus, understanding the labour market behaviour of older adults in China in the past and present, and in the years to come, is important both for the effective functioning of the labour market as well as for broader society. Against this background, this thesis aims to achieve a comprehensive understanding of the labour market behaviour of older adults in China by addressing the following research questions:

RQ 1 What are the labour force participation patterns of older adults in China and how do these vary across different social groups?

RQ 2 What are the patterns of labour market exit of older adults in China and how do these vary across different social groups?

RQ 3 What are the work history patterns of older adults in China and how do these vary across different social groups?

RQ 4 What are the correlates of the labour force participation of older adults and how can they explain the heterogeneity in labour force participation between different social groups?

RQ 5 What are the predictors of the labour market exit in later life and how can they explain the heterogeneity in labour market exit between different social groups?

RQs 1 to 3 help to frame the understanding of the patterns of labour market behaviour at different time points, with a focus on the heterogeneity within labour market behaviour between different social groups. On the other hand, RQs 4 and 5 guide the analysis on the factors influencing labour market behaviour in later life at different levels, including individual characteristics, family characteristics and work experiences in the past. These two groups of research questions are related to each other – results on the heterogeneity within labour market behaviour shed light on the importance of factors that influence the labour market whereas the results for these factors explain the heterogeneity within labour market behaviour at both the micro- and macro- levels.

To address these RQs, existing literature in relation to the labour market behaviour of older adults are reviewed in Chapter 2. Based on the theoretical and empirical evidence a conceptual framework that fills the research gaps in the Chinese context is developed. Following this conceptual framework, quantitative methods were chosen as the most appropriate method to address the RQs in this thesis, which are a combination of univariate, bivariate and multivariate analysis (Chapter 3).

To reflect the patterns of labour market behaviour over the life course, descriptive analysis was conducted in Chapters 4 to 6. The patterns of the labour force participation at one point in time, the transition into economically inactive status over a period and the entire work histories are presented. On the other hand, to analyse the factors influencing the labour market behaviour in later life, multivariate analysis was conducted in Chapters 7 and 8. The next two sections discuss the results of these two aspects respectively and how they add depth to our understanding of the labour market behaviour of older adults in China.

9.3 Summary of findings on the patterns of labour market behaviour of older adults in China

9.3.1 Heterogeneity in labour market behaviour over the life course

The heterogeneity within labour market behaviour is one of the most important findings of this thesis. With the research focusing on different observation periods, the results of this thesis show that the significant urban-rural differences and gender differences in labour market behaviour persist from the beginning to the end of the older individual's working lives, which have been largely shaped by the economic and social transformation that has taken place in China over the past 50 years and by recent policy reforms in terms of the social protection system.

In terms of the urban-rural differences, rural residents experienced much higher labour force participation rates, especially the older age groups who have reached the SPA (Chapter 4). The patterns of the transition into economically inactive status over an extended time period confirm these differences (Chapter 5). Rural residents from all age groups are less likely to experience labour market exit than urban residents over the same period, especially after the SPA. In both chapters, the status of working (or leaving the labour market) differs by economic status as well, where non-agricultural work is generally related to a higher labour force participation. In contrast, the differences in labour force participation between individuals with different work intensity are smaller. These findings on the urban-rural differences are in accordance with the cross-sectional results from existing studies (Benjamin *et al.*, 2003; Pang *et al.*, 2004; Zhang *et al.*, 2014; Giles *et al.*, 2015).

The length of the observation period is further extended to the entire working lives (Chapter 6). Results drawing on novel work history data reflect that inequalities in labour market behaviour persist over the working lives of current older adults. Rural residents are more likely to engage in agricultural work and leaving late from the labour market. Although a series of social events have taken place since the start of 1950s, which have shaped the life trajectories of individuals in terms of education and work experiences (e.g. Send-down Movement and Lay-off Wave), these events did not cause dramatic changes in terms of the urban-rural differences in the labour market. The fact that these differences started to exist from the beginning of the life course means that the economic and labour market policies since the 1950s have had an impact on the labour market outcomes of individuals, even when the economic regime was still the centrally-planned one.

The urban-rural differences are related to the distinction between labour market rights and welfare benefits that are linked to different Hukou status. Although the urbanisation of rural

areas and the flow of migrant workers into urban areas have become very prevalent since the 1990s (Li, 2008), the current older population is less likely to have been affected by this trend. The welfare benefits that current elders are entitled to in their later years are still attached to their rural Hukou. In contrast, their working experiences and contributions to the urban areas and the formal sector are not rewarded. Migrant workers' contributions to the urban labour market and economic system are actually based on their family members as a unit, where 'stay-behind' elders play an important role in taking care of the grand-children and of the properties left in rural areas. Thus, the well-being of older adults residing in rural areas requires urgent attention by the government so that their important contributions to the society are not overlooked.

The analysis of the work trajectories of older adults in China in this thesis is pioneering, as very few studies have examined this topic in the Chinese context. The comparison between the urban and rural residents under different economic and institutional backgrounds provides an interesting case study on the explanation of heterogeneity between different welfare regimes, as the majority of inter-country comparisons within the Western literature uses the typology proposed by Esping-Andersen (1999). The results in this thesis address whether variations in life histories are more pronounced in two different kinds of economic and welfare regimes within a single country, i.e. rural and urban China, where one system is much less modern than the other one. In addition, the results provide further understanding of the life trajectories of residents from countries with a transitional economy, which has been less discussed in the existing literature. The few exceptions are basically limited to the family trajectories and the impact of family values rather than the broader context, such as the work of Simonson *et al.* (2011).

The gender differences in labour market behaviour are less pronounced than the urban-rural ones and they are much smaller than those commonly observed in the Western context. The results in Chapters 4 to 6 reflect that both men and women have worked intensively (and full-time) in most years over their life course, which reflects the prevalence of the dual-earner family model in China.

The results in this thesis also show that some older women have faced difficulties in terms of combining full-time work and family responsibilities, especially those in the formal sector, which in part reflects the lack of childcare services available after the opening up of China and the period of economic reform. The work pathways of the current generations of Chinese older women contain more periods of inactivity and fewer accumulated years in work than men, indicating that women were more likely to interrupt work to focus on their family responsibilities, such as child-bearing and child-rearing. However, there is a lack of support from the social protection available on leaving and returning to the labour market due to motherhood. Daughters who have more

personal contact with their parents are preferred to be caregivers by their parents (Cong and Silverstein, 2014). Urban women's greater family responsibilities may have meant that they had fewer opportunities to achieve seniority positions whilst in work, with consequently lower wages and subsequent pension benefits. In rural areas, older women are more likely to experience being 'left behind' than their partners, remaining working in the countryside and taking care of the land and family members (Wu and Ye, 2016; Ye *et al.*, 2016). It is also worth noting that the contributions that older adults make to other family members are large, especially for women. The provision of skipped-generation care may push some of them out of the labour market (see Section 9.4.2).

The public pension system, and the difference between entitlements for urban and rural residents, underlies the urban-rural differences in labour market behaviour. The system also serves to exacerbate gender inequalities, reflecting norms around the division of work and family responsibilities between the genders in China. The five-year gap in the SPA of women leads to a much earlier labour market exit. Such policies have a negative impact on not only women's self-development concerning financial gains from their work positions and financial well-being in later life but also the use of the human resources of the older population for society. On the other hand, the inequalities in the labour market have a negative impact on the viability of the pension system in turn and they are a major impediment to the pension reform and extending the working life of older adults.

9.3.2 One-time exit continues to be the norm of labour market exit

A noticeable feature of the labour market behaviour of older adults is the norm of the traditional one-time labour market exit. Chapter 6 reflects the continuity of work trajectories and the limited exit from and re-entry into the labour market during the life course. The results in Chapters 5 and 6 also indicate the lack of gradual (or phased) retirement, where changes in the working hours are not related to the transition into economically inactive status. It appears that individuals lack the choice of transferring to part-time work or switching to another bridge job between full-time work and economically inactive status in later life. Such patterns are in contrast to the prevalence of part-time work and bridge jobs that have been reported in the Western literature (e.g. Cahill et al., 2015; Kim and DeVaney, 2005).

There is little evidence of a late exit after the SPA or work after retirement. The proportion of those working past the SPA is much lower than in all OECD countries (Duval, 2003). These results imply that to some extent, the transition into economically inactive status in the Chinese context can be involuntary and unexpected, which is related to the role of the SPA and the public pension

system in shaping individuals' labour market decisions. In this sense, breaking the 'invisible ceiling' of labour market exit for older adults may enable those intending to continue work after the SPA to stay in the labour market longer and to help to improve the potential labour force participation of older adults.

An important explanation for the absence of relevant policies on encouraging gradual retirement is that extending the working lives of older people is regarded as leading to unemployment issues amongst younger adults. There are concerns about conflicts over working positions between the young and the old in the public (Zhang, 2012). However, research evidence has shown that the two elements are actually positively related and that elderly employment does not squeeze out youth employment (Gruberet al., 2009; Zhang, 2012). The better use of older labourers in later life actually boosts the GDP, and this highlights the feasibility of advocating gradual retirement.

9.3.3 Changes in work histories across cohorts: the process of de-standardisation yet the heterogeneity between different groups remains large

The changes in work histories over the past decades are mainly discussed in Chapter 6. There is a trend towards de-standardisation in the work trajectories amongst both urban and rural residents, which is related to the changing economic and institutional background. Economic activity status during the pre-reform era is more much institutionalised and homogeneous. During the reform and opening-up era, the impact of the planned economy system on the working lives of individuals declined. The younger cohorts in both living areas experienced de-standardisation in their working lives, reflected by the increasing share of working years in the private sector and in other new economic forms. However, considering the dramatic changes in the economic and welfare regimes, the trend towards individualisation is not as significant as we expected. It is notable that when the market economy began to take shape in the 1990s, respondents from the youngest cohort in this study were aged at least 40 and it may have been difficult for them to transfer to another sector or organisation. Today's current middle-aged adults have been involved in the new economic system since the beginning of their career lives and they will have more options for adjusting their work trajectories. This is especially the case when the improvement of education and changes in family characteristics are taken into account.

The gap between urban and rural labour markets remains large and implies a slightly increasing inequality between urban and rural residents. The differences in economic activity status and the timing of leaving the labour market have continued to be the case over the past sixty years. In addition, the duration of inactivity amongst urban residents is gradually growing as a result of an earlier labour market exit, whilst the working years of rural residents become slightly longer.

Compared to the pace of changes within urban and rural residents, the gender differences in work histories persist, reflecting that the institutional context has continued to play an important role. In addition, it appears that the pace of the de-standardisation of women's work trajectories is a little slower than men, especially in urban areas. This means that women will continue to be disadvantaged in the labour market. The slightly less number of working years and the increasing proportion of respondents with limited economic activities increases within urban residents, which indicates that the heavy burden on the public pension system persist.

9.4 Summary of findings on the factors influencing labour market behaviour in later life

Chapters 4 to 6 first present the variations in labour market behaviour between groups with different individual and family characteristics. Chapters 7 and 8 provide an in-depth understanding of the impact of the factors influencing the labour market behaviour in later life. Specifically, this thesis carried out multivariate analysis using longitudinal data, using the characteristics of older individuals prior to the labour market decision as explanatory variables to provide more convincing evidence on how factors at different levels have shaped the labour market behaviour (rather than the reverse causality).

9.4.1 The impact of individual characteristics

At the individual level, the impact of health status and financial status on labour market behaviour in later life has been a particular research focus of this thesis. Both aspects are shown to be important to the decisions of labour market behaviour in later life.

First, health status is an important push factor that stops people from staying in the labour market, which is similar to the findings in existing literature (e.g. Disney et al., 2006, see Section 2.3.2). For rural residents, the impact of health status is strong on the labour force participation in 2013 (Chapter 7) and on the labour market exit over the period from 2011 to 2015 (Chapter 8). For urban residents, health status is important as well but it becomes less significant concerning the transition into economically inactive status over the four-year period. In addition, there might be a lower diagnosis and self-reported rate of chronic illness amongst rural residents, which leads to the possible under-estimation of chronic illnesses.

The results on the importance of health status raise concerns about the well-being of rural residents in later life as they are more likely to engage in physically intensive or low-skilled work positions which require better health status. This can have a negative impact on their health

status in later life in turn (e.g. Wilson, 2001, see Section 2.3.2) . In this sense, the inequalities in the labour market can further lead to inequalities in health status.

Second, the impact of financial resources on labour market behaviour in later life is complex. On the one hand, the association between labour market outcomes and the SES of individuals is shown to be less important than what has been suggested by the literature (e.g. Radl, 2013; see Section 2.3.3). This applies to the indicator of educational attainment, housing tenure and annual household expenditure. In Chapter 7, the negative association between SES and labour force participation is only confirmed amongst rural residents where annual household expenditure is used as the indicator. The association is not significant for educational attainment and housing tenure. In Chapter 8, none of them are significant predictors for the labour market exit of older adults. It appears that older adults might be more sensitive to proximate financial resources rather than the stocking of wealth, the latter of which is measured by these indicators. These results reflect that many older adults may be vulnerable to shocks in wealth or other risks in later life, as the main form of wealth is their properties and the only available resource of money is from the public pension system or their family members.

The pension benefits of the OPP are shown to be a strong predictor of labour market behaviour in later life in both Chapters 7 and 8. The public pension system works as financial support in later life and older people seek opportunities to leave the labour market permanently once they can. There are not enough financial incentives to keep them in the labour market from the system itself. Other factors that keep people staying in the labour market (for example, satisfaction of work) are less important when compared to financial status. Besides that, the SPA may set limitations on the timing of retirement. These results indicate that the decisions of labour market behaviour are strongly linked to institutional background. In this case, the situation of those who experienced the dramatic change in the public pension system in the 1990s should be given special consideration. This includes the Lay-off workers who may quit the public pension programme in their middle years and the current migrant workers who have no access to the OPP. Both groups may be at risk of having enough economic recourses in later life and to have to continue to work in advanced age.

9.4.2 The impact of family characteristics

Another important aspect of the contribution of this thesis is the investigation into the impact of interaction with family members on labour market behaviour in later life. The results contribute to the relevant literature in the Chinese context on the importance of intergenerational transfer in terms of money and time.

First, marital status is shown to be strongly associated with labour market behaviour in later life in both Chapters 7 and 8. Compared to the married group, respondents with another marital status are less likely to work (Chapter 7) and they are more likely to leave the labour market (Chapter 8). The tendency towards joint labour market exit of couples has been observed in both chapters. The results confirm the impact of the preference of leisure with spouses and of the family networks and living arrangement that are embedded in individuals' choices. This is especially the case in rural areas where the family is considered as a unit for labour decisions.

Second, the intergenerational transfers of money and time have different meanings for the labour market behaviour of older adults. The association between labour market behaviour and material transfers is significant for urban men and rural residents in Chapter 7 but it is not a significant predictor of labour market exit in Chapter 8. It appears that intergenerational material transfers work as a supplementary income and that they have a similar effect as SES.

In terms of the time devoted to family members, the care provision to grandchildren is significantly related to the labour market behaviour of both urban and rural women in Chapter 7. The impact of care provision to grandchildren for women on labour market exit is also observed in Chapter 8. In contrast, the care provision to parents is less important concerning labour market decisions.

Both types of intergenerational transfers are intense (Chapters 4 and 5). Even under the strong influence of the institutional background as discussed in Section 9.4.1, family factors remain to be significant factors that influence the labour market decisions in later life. Under the norms of filial piety and family reunion in China (Zhan and Montgomery, 2003), reciprocity and support between family members have been a central feature of intergenerational relationships and this will continue to be prevalent in the next few decades at least.

This situation raises concerns about the importance of unpaid care provision from older adults to society. The current literature has indicated that the informal care from grandparents is an important element to reconciling work and family for women in some OECD countries (Aassve, Arpino and Goisis, 2012; Kanji, 2018). This study confirms the hypothesis that family reciprocity is accorded a high value in the Chinese context. While the time devoted to family care is an important method of making use of the human resources, there may be a potential conflict between the contribution of older adults within the families as opposed to their contribution to the labour market. As shown in Chapter 6, the older adults' (especially women) devotion to their families rather than to their own work may result in poor financial wellbeing in later life, with the older adults being financially vulnerable. This highlights the importance of relevant policies in

order to achieve a balance between the provision of unpaid family care and supporting the continued labour force participation of older adults.

9.4.3 Work histories and labour market behaviour

The analysis on the work trajectories of older adults in Chapter 6 shows that the inequalities in the labour market continue over the life course. The results in Chapters 7 and 8 further show the association between work trajectories and labour market outcomes in later life.

The most significant distinction exists between respondents with work experiences in the formal and informal sectors. In particular, there are differences in the labour force participation in later life between groups with long-term agricultural work and with long-term non-agricultural work. Such patterns exist in both urban and rural areas. Agricultural workers rarely have access to the OPP and need to continue working when approaching advanced age. In addition, respondents with the work trajectories of agricultural work and multiple jobs are found to have a lower probability of working compared to long-term agricultural workers over the life course. These respondents are more likely to be migrant workers and have access to higher financial rewards from the OPP, thus they are less likely to work than other rural residents. These results attach importance to the public pension system.

The other important finding is the impact of inactivity on labour force participation. Such an impact varies in terms of the length of inactivity (Chapter 7). Specifically, shorter inactivity (interruptions to the work experiences) is correlated with a higher probability of labour force participation in later life whereas those with long-term inactivity in the majority of their lifetime are less likely to work in later life. Shorter inactivity can cause the loss of the accumulation of financial resources as well as pension benefits over the life course, whilst longer inactivity is likely to indicate their attitude towards work. However, the inactivity related to work in the past is not a significant predictor of the transition into an economically inactive status (Chapter 8). The reason for this is that the transition into an economically inactive status is a rare event, since the observation period was only four years and the subsample was relatively small. Thus, the impact of the long-term experiences can be less significant than the author's assumptions.

9.5 Policy implications

Based on the findings summarised in Sections 9.3 and 9.4, this section discusses the actions to be taken by policymakers in order to make better use of older workers from three aspects. Reducing inequalities in the labour market in order to support the reforms aimed at extending the working lives of older labourers is the most important step towards a financially sustainable pension

system. The provision of supportive family policies is also essential in order to ease the competing pressure of family obligations on the labour market behaviour and to help individuals keep a balance between work and family domains. Lastly, establishing a health ageing agenda in the broader context apart from the labour market policies in the long term will have a positive impact on the individuals' understanding and willingness toward labour force participation as well.

9.5.1 Improve the public pension system and the labour market policies

The current social welfare system in China does not provide equal access and benefits to different social groups. The urban-rural differences in the labour market behaviour are outcomes of the economic development strategy and the related revisions of the social welfare system since the 1950s. The current opposition to increase the SPA from the public is largely related to the inequality of pensions amongst the heterogeneous ageing population. In order to increase the equality of the current public pension system, multifaceted policies which identify the needs of different subgroups can be helpful at this stage.

Given that the current average age for leaving the labour market is relatively low amongst older urban workers, urban employees should be encouraged and supported to work longer. The gap in labour force participation rates around the SPA reflects that the older worker's preferences for working may not be fully supported. Developing flexible retirement policies in terms of the age eligibility criteria to reduce involuntary labour market exit around the SPA is a relevant strategy based on findings in this thesis. In order to achieve the gradual or phased retirement that is shown to be increasing in many Western countries (Hasselhorn and Wenke, 2015), there is a need for policies that allow for more days off, more flexible working hours and bridge jobs to facilitate the shift in working experiences that older people may experience (Pavalko and Henderson, 2006; Audino and Mason, 2017). In addition, improving the calculation method of pensions to provide stronger financial incentives can be another solution to encourage older employees to stay longer in the labour market. Although this thesis did not conduct an actuarial analysis of the pension benefits, evidence has shown that proceeding to retirement once it is eligible to do so is most beneficial for the employees under the current pension policies in China (Wang and Zeng, 2004). The age-neutral settings of benefits can lead to extended working lives, as is shown in the case of Germany, where changes in the base early retirement age and the related calculation of benefits raised the average effective retirement age for men by almost 2 years (Börsch-supan, 1992; Berkel and Börsch-Supan, 2004).

In order to provide rural workers with more options in later life and a better quality of life, it is necessary to improve both the coverage and value of pension benefits. The Resident's Social

Pension Programme is a good start. Within the first few years of its operation, high levels of coverage have been attained. However, the benefit levels remain low, meaning that many rural elders continue to work out of financial necessity. The revision of the current Hukou system and the Occupational Pension Programme with enlarged targeted groups will provide more equal access to migrants and non-migrants alike in the background of China's rapid urbanisation.

Lastly, concerning gender differences, given that inactivity in the labour market can lead to financial inequalities in later life and the fact that older women retire 5-10 years earlier than men, there is a need to revise the regulations on the SPA and the calculation methods for pensions to improve gender equality in the labour market.

9.5.2 Supportive family policies

The results in this thesis show that family obligations have an impact on the labour market behaviour of older adults, which confirms that work and family are highly inter-correlated life domains (Börsch-Supan et al., 2013). Specifically, those with elder parents and young grandchildren may share the features of being a 'sandwich generation' (Seaward, 1999; Pierret, 2006), experiencing a heavy burden from their family obligations. Thus, it is important to develop supportive family policies focused on informal care within families.

Given the persistence of gender differences, relevant policies need to support the reconciliation of full-time work and family responsibilities for female employees. This is especially the case against the background of the termination of the one-child policy in 2013, where women may experience increasing competing pressure from motherhood on their work trajectories, which may further reduce the working years of women. Specifically, the women who make greater contributions to the economy are more likely to be affected, which is shown by the link between the family and work domains in Chapter 6. Flexible working patterns (e.g. longer maternity leave, flexible days off and shorter working hours) might be encouraged to facilitate women's caring responsibilities such as child-bearing and child-rearing.

9.5.3 Overarching agenda for healthy ageing

With the background of increasing life expectancy and low fertility rates as forecasted, the ageing population will continue to grow in this century. In this sense, there is a need for action across multiple sectors enabling older people to remain a resource to their families as well as to society. An over-arching agenda for healthy ageing can be relevant in the Chinese context, under which the multiple meanings of social policies can be recognised and finally contribute to the improvement of the quality of life of older adults. For example, extending the working lives of

older adults, as discussed in this thesis, should be identified as a measurement to improve not only the operations of the labour market and the public pension system, but also the well-being of older adults in the broader context.

Healthy ageing is defined as 'the process of developing and maintaining the functional ability that enables wellbeing in older age'. Functional ability is made up of the intrinsic capacity of the individual, the relevant environmental characteristics and the interaction between them (WHO, 2015). The level of intrinsic mental and physical capacity is influenced by a number of factors such as the presence of disease. Environments include the home, community and broader society and the elements within them that can affect the environment, such as personal relationships, attitudes and values.

Support on both the functional ability and the environments is key to the healthy ageing agenda. Two aspects of specific policies can work as an important part of the healthy ageing agenda in relation to the findings in this thesis. The first aspect is to improve the health status of older adults, as this thesis shows that deteriorated health status is a strong restriction of the labour market behaviour of older adults and this also has a negative impact on the well-being of older adults in later life. Given the health status of rural residents and the low diagnosis rates of illnesses, free physical examinations should be implemented in rural areas.

The other aspect is to encourage the values of an ageing-friendly society and the positive old-age image across the entire population. Age pessimism concerning self-image, such as the evaluation of health, is found to be related to negative labour market decisions in later life. Such values can affect the decisions of employees as well as employers in the workplace (Brown and Vickerstaff, 2011). The healthy ageing agenda should help older people to realise their potential and to create friendly environments that enable them to do what they value throughout their lives.

9.6 Limitations of the research

There are a number of potential limitations in this study in terms of the availability of the data and the methodology. Improvements in these aspects could further increase the validity of this study. The first limitation is that the four-year observation period for understanding the transition into economically inactive status amongst older adults may be short. The author has made use of the most recent available wave of the CHARLS but the longest possible observation period is only four years. As a result, the sample of interest, i.e. respondents who were working in 2011 and who experience a labour market exit, is relatively small, especially amongst urban women. This fact may have led to the insignificance of certain indicators in the Model B series, even though

said indicators are shown to be strongly related to the labour market behaviour in the descriptive analysis in Chapters 4 and 5 and the models developed in Chapter 7.

The second limitation is the methodological issues related to the retrospective life history data. On the one hand, as discussed in Section 3.5.4, the CHARLS did not provide weights for the Life History Wave. Although the differences between the results with and without weight are not large, the un-weighted sample has a slightly lower representativeness of the oldest cohort and the widowed group within all four subgroups, and of the urban residents not receiving pensions from the OPP. Given that all of the analysis of labour market behaviour has been carried out by subgroup, this minimises the potential impact of not using weights and increases confidence in the relevant conclusions of this study. There are also limitations in the questionnaire design. Retrospective data can be less detailed and less accurate concerning past experiences in the early years of individuals. In this study, the construction of work intensity over the life course may be affected. In particular, information on the working hours was only available for the first year of each work episode (respondents with work episodes of longer than 20 years were also asked about the working hours of the middle years and end year). In this sense, using working hours to construct the variable of work intensity (i.e. full-time, part-time) may be inaccurate, which is the case for any life history data. This is also the reason that we believe that the work states are more reliable and representative of the work pathways in the Chinese context. Third, it is difficult to capture short-term inactivity (inactivity of less than 6 months) which may also lead to the under-estimation of interruptions of work. Periods are not captured and so cannot be reflected in our trajectories.

9.7 Recommendations for future research

Relevant research in two future directions can further improve our knowledge of the factors associated with older adults. The first recommendation for future research is to understand the individuals' subjective perceptions and evaluations of their labour market behaviour (including retirement) with the application of qualitative studies. The absence of relevant information is not only limited to the CHARLS but also to other current large-scale surveys of Chinese individuals, such as CHNS. For instance, this study could be further enriched with information on the reasons for being economically inactive or leaving the labour market over the life course. While this thesis provides evidence on the negative association between informal care and labour force participation, additional information on the subjective evaluations of the reason to be economically inactive can provide further evidence on the link between family responsibilities and labour market outcomes. In addition, it will be able to reflect whether an individuals' intentions

can convert to the actual realisation of labour market behaviour and whether there are any restrictions during the decision-making process.

Investigation into the intention of retirement, as opposed to the realisation of retirement, has been little done in the Chinese context, and it has been considered more frequently in Western literature. There is evidence on the importance of the individuals' self-evaluation of their work and their labour market behaviour in the existing literature. The work positions reported to provide a higher sense of achievement are found to be more likely to keep individuals in the labour market (Mein et al., 2000; Damman et al., 2015; Scherger et al. 2016). Work satisfaction is important in terms of encouraging people to stay in the labour market. In contrast, dissatisfaction induces people to retire (Mein et al., 2000; Smeaton and McKay, 2003; Siegrist et al., 2007; Kubicek et al., 2010). For example, they take early retirement to become more involved in their outside interests and to lessen work dissatisfaction (Higgs et al., 2003). The work of Raymo et al (2010) reported that individuals who achieve their work aspirations were more likely to remain in the labour market. These studies in relation to the subjective evaluation of work may provide further evidence on how labour market behaviour can be a voluntary option rather than a compromise. The relevant results can be important for China's healthy aging agenda for the older population.

The second recommendation is about understanding the pathways that link the outcomes in later life, individual characteristics and early experiences. The results in this study show that even when the impact of institutional factors came to a peak during the pre-reform era, individual characteristics (education attainment and early experiences in the formal sector) still played an important role in shaping the work trajectories. Similarly, although the gender differences of the work trajectories and the pace of de-standardisation in China do indeed differ from the findings in the Western context in part because of work ideology and the institutional background, there are important differences in terms of the number of children and also by parental characteristics. Such findings highlight the importance of further research in order to investigate the association between individual characteristics, experiences over the life course and the outcome in later life. At present, there is a growing body of empirical evidence focused on the impact of early-life trajectories on outcomes in later life in the European context, such as the quality of life, financial status, the access to pensions and medical care and the timing of retirement (Han and Moen, 1999; Sefton et al., 2011; Wahrendorf, 2015; Stone et al., 2015; Scherger et al., 2016b). Relevant studies in different contexts are still limited. In this sense, this thesis is a modest but important contribution to the start of a rich research agenda as more longitudinal data becomes available in the research community.

Appendices A Tables

Table A.1 Key statutory documents related to the public pension system since 1980s

Year	Name	Major announcements
1991	Decision on the reform of occupational pension system for enterprise workers (关于企业职工养老保险制度改革的决定)	This document announced that the government, enterprises and individuals were responsibility subjects (contributors) of the public pension system and provided initial design of the mandatory first pillar and second pillar.
1993	Decision on specific issues in establishing socialism market economy (中共中央关于建立社会主义市场经济体制若干问题的决定)	These documents claimed the necessity of adding an individual account pillar which is separated from the social pooling account in the public pension system.
1995	Notice of the reform of the endowment insurance System for enterprise Workers(关于深化企业职工养老保险制度改革的通知)	
1997	Decision on the establishment of a unified occupational pension system for enterprise employees (关于建立统一的企业职工基本养老保险制度的决定)	This document provided operational details on the payment methods of the individual account. Besides that, the document provided calculation methods of pension benefits for different groups, as older cohorts did not have enough accumulations in individual accounts when reaching statutory retirement age. Individuals who retired before 1997, who retired between 1997 and 2005, and those who retire after 2005 apply to different calculation methods of pension benefits to ensure a proper replacement rate.
1997	Notice on the establishment of the Subsistence Allowance system amongst urban residents (关于在全国建立城市居民最低生活保障制度的通知)	This document announced the establishment of Subsistence Allowance Programme for urban residents.
2000	Pilot projects on the improvement of urban social insurance system (关于完善城镇社会保障体系的试点方案)	The document stated that the previously emptied individual accounts should be fully funded.
2004	Operational methods of enterprise annuities and the management of the fund (企业年金试行办法&企业年金基金管理试行办法)	This document announced the establishment of the Enterprise Annuity Programme.

Appendices

Year	Name	Major announcements
2005	Decision on the improvement of the occupational pension system for enterprise employees (国务院关于完善企业职工基本养老保险制度的决定)	This document incorporated flexible workers into the occupational pension system for the first time and provided specific operational regulations on their payment methods and benefit levels.
2007	Notice on the establishment of the Subsistence Allowance system amongst rural residents (关于在全国建立农村最低生活保障制度的通知)	This document announced the development of Subsistence Allowance Programme for rural residents.
2009	Instructions on the pilot projects of the New Rural Social Pension Programme (国务院关于开展新型农村社会养老保险试点的指导意见)	The document was symbolic in covering agricultural workers into the multi-pillar public insurance system.
2011	Instructions on the pilot projects of the Urban Residents' Social Pension Programme (国务院关于开展城镇居民社会养老保险试点的指导意见)	The document was symbolic in covering urban residents who may not be able to participate in occupational pension programmes into the multi-pillar public insurance system.
2014	Instructions on the Residents' Social Pension Programme (国务院关于建立统一的城乡居民基本养老保险制度的意见)	The document announced a unified Residents' Social Pension Programme which combined the New Rural Social Pension Programme and then Urban Residents' Social Pension Programme.
2015	Decision the reform of the Occupational Pension System for formal employees in the government and public institutions (国务院关于机关事业单位工作人员养老保险制度改革的决定)	The document announced that normal employees in the government and public institutions should pay for their individual account by themselves and would not have the privilege to benefit from fiscal appropriations anymore.

Source: Author's own analysis.

Table A.2 'Calculated Number of month' for the pension benefits of the OPP since 2005

Retirement age	Deemed contributing month	Retirement age	Deemed contributing month
40	233	56	164
41	230	57	158
42	226	58	152
43	223	59	145
44	220	60	139
45	216	61	132
46	212	62	125
47	208	63	117
48	204	64	109
49	199	65	101
50	195	66	93
51	190	67	84
52	185	68	75
53	180	69	65
54	175	70	56
55	170		

Source: (State Council of China, 1997, 2005, 2014b).

Table A.3 Sample Profile (Sample A, N=17,316)

Characteristics	Urban men	Urban women	Rural men	Rural women	Valid N
Sample size	2,071	1,859	6,343	7,043	17,316
Age group (percentage)					
- 45-49 cohort	11.5	15.8	14.8	17.4	
- 50-54 cohort	15.4	17.5	16.8	17.4	
- 55-59 cohort	17.4	18.8	19.4	18.0	
- 60-64 cohort	18.0	17.1	19.0	18.3	
- 65-69 cohort	14.5	11.4	12.3	11.4	
- 70+ cohort	23.2	19.4	17.6	17.5	17,316
Have any ADL difficulties (percentage)	12.5	15.3	15.6	20.1	17,315
Have any IADL difficulties (percentage)	12.6	15.6	16.4	24.8	17,315
Have any chronic illnesses (percentage)	70.0	70.3	65.0	68.9	17,315
Educational attainment (percentage)					
- Illiterate	4.3	13.6	15.2	45.9	
- Did not finish primary school	9.1	10.1	21.4	20.2	
- Finish primary school	16.8	17.1	28.0	17.6	
- Finish junior school	28.7	27.1	25.9	13.0	
- Finish senior/vocational School	27.9	25.4	9.2	3.3	
- Have university/college degrees	13.2	6.8	0.4	0.1	17,300
House ownership (percentage)	80.7	79.5	84.2	82.9	16,609
Median house value of respondents with their own properties	160,000	200,000	60,000	60,000	13,581
Median annual household expenditure per capita	7,409	7,611	4,747	4,719	17,316*
Occupational Retirement Insurance Programme (percentage)					
- Recipient	47.8	49.5	2.4	1.0	
- Contributor	26.9	12.7	4.0	2.0	
- Did not participate	25.3	37.8	93.6	97.0	17,192
Median number of benefit levels per month (recipient only, N=2639)	2,100	1,689	1,500	1,000	2,048
Residents' Social Pension Programme (percentage)					

Characteristics	Urban men	Urban women	Rural men	Rural women	Valid N
- Recipient	4.9	10.8	33.0	32.9	
- Contributor	7.1	7.5	41.0	42.0	
- Did not participate	88.0	81.7	26.0	25.1	17,221
Median number of benefit levels per month (recipient only, N=4693)	490	550	60	60	4,603
Recipient of both programmes at the same time	2.1	2.7	1.2	0.3	17,155
Marital Status (percentage)					
- Married, spouse working	32.8	38.0	60.5	63.8	
- Married, spouse not working	51.0	38.1	21.2	14.8	
- Married, spouse working status unknown	9.4	5.2	8.4	5.2	
- Separated or divorced	2.1	2.6	1.3	0.5	
- Widowed	4.3	16.0	6.7	15.7	
- Never married	0.4	0.1	1.9	0.1	17,316
Average number of surviving children	2.2	2.2	2.7	2.9	17,316
Average age of youngest surviving child	31.0	31.9	29.1	30.5	17,316
Material transfer with family members (children and parents; percentage)					
- No transfer with family members	40.7	41.2	31.2	29.5	
- recipients Only	23.5	23.4	33.6	38.0	
- providers Only	21.6	21.8	15.8	13.8	
- recipients and providers	14.3	13.6	19.5	18.8	17,316
Have any grandchildren under 16s (percentage)	60.1	57.1	74.8	79.0	17,231
Care provision to grandchildren (percentage)					
- No care provision	69.9	68.3	68.5	60.9	
- Less than 10 hours per week	8.1	7.9	8.8	8.5	
- More than 10 hours but no more than 20 hours per week	3.8	3.7	4.1	4.4	
- More than 20 hours per week	18.3	20.1	18.6	26.2	17,231
Median number of caring hours to grandchildren per week (carer only N-)	29.5	42.2	29.2	46.1	5,937

Characteristics	Urban men	Urban women	Rural men	Rural women	Valid N
Have any surviving parents/parents-in-law (percentage)	47.8	46.9	47.1	43.6	17,231
Have any alive parents (percentage)	60.1	57.1	74.8	79.0	17,231
Care provision to parents (percentage)					
- No care provision	85.3	84.6	90.9	91.0	
- Less than 10 hours per week	8.8	10.1	5.2	5.7	
- More than 10 hours but no more than 20 hours per week	3.9	2.4	2.6	1.8	
- More than 20 hours per week	2.1	2.9	1.3	1.6	17,316
Median number of caring hours to parents per week (carer only)	12.8	14.7	14.2	14.2	1,797

Note: Imputation is applied to household expenditure (see Sections 3.6.1.3).
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Table A.4 Sample Profile (Sample B, N=9,312)

	Urban men	Urban women	Rural men	Rural women	Valid N
Sample size	641	342	4,196	4,132	9,312
Age in 2011					
- 45-49 cohort	25.3	46.2	20.4	25.0	
- 50-54 cohort	18.7	17.5	16.4	17.3	
- 55-59 cohort	25.1	17.8	23.8	23.4	
- 60-64 cohort	14.0	10.2	19.3	17.7	
- 65-69 cohort	10.1	5.6	10.9	10.0	
- 70+ cohort	6.7	2.6	9.3	6.5	9,312
Health changes (any ADL difficulties) (percentage)					
- Good health in 2011 & 2015	87.2	84.2	77.7	68.7	
- Good health in 2011 & Poor health in 2015	6.4	9.1	10.6	15.5	
- Poor health in 2011 & 2015	3.4	5.0	6.3	8.3	
- Poor health in 2011 & Good health in 2015	3.0	1.8	5.3	7.6	9,311
Health changes (any IADL difficulties) (percentage)					
- Good health in 2011 & 2015	87.4	83.9	78.0	63.3	
- Good health in 2011 & Poor health in 2015	6.2	7.3	10.5	16.5	
- Poor health in 2011 & 2015	4.7	5.3	7.5	11.5	
- Poor health in 2011 & Good health in 2015	1.7	3.5	4.0	8.8	9,311
Prevalence of any chronic illnesses					
- No chronic illnesses in 2011 & 2015	24.5	27.5	24.4	20.6	
- No illness in 2011 & have illnesses in 2015	9.2	12.3	12.4	10.8	
- Have chronic illness in 2011 & 2015	66.3	60.2	63.2	68.7	9,309

	Urban men	Urban women	Rural men	Rural women	Valid N
Educational attainment					
- Illiterate	4.1	14.9	13.2	45.5	
- Did not finish primary school	8.1	8.8	21.2	20.1	
- Finish primary school	14.5	12.3	28.3	17.6	
- Finish junior school	28.9	27.2	27.2	13.4	
- Finish senior/vocational School	32.5	26.3	9.8	3.3	
- Have university/college degrees	12.0	10.5	0.3	0.1	9,306
Have one's own house in 2011 (percentage)	88.0	86.0	88.5	88.0	9,312
Have one's own house in 2015 (percentage)	83.5	79.8	83.4	83.2	9,312
Median number of household expenditure in 2011	5189	5692	2946	2892	9,312*
Median number of household expenditure in 2015	5850	6540	3180	3224	9,312*
Mandatory Occupational Retirement Insurance Programme in 2011 (percentage)					
- Recipient	28.1	20.8	1.6	0.5	
- Contributor	34.5	28.1	4.0	2.1	
- Did not participate	37.4	51.2	94.4	97.5	9,312
Mandatory Occupational Retirement Insurance Programme in 2015 (percentage)					
- Recipient	50.6	45.9	4.0	2.1	
- Contributor	24.8	7.3	2.0	0.5	
- Did not participate	24.7	46.8	94.0	97.4	9,312
Residents' Social Pension Programme in 2011					
- Recipient	4.7	6.1	11.2	11.2	9,312

	Urban men	Urban women	Rural men	Rural women	Valid N
- Contributor	3.7	6.1	25.1	25.5	
- Did not participate	91.6	87.7	63.7	63.3	
Residents' Social Pension Programme in 2015					
- Recipient	7.0	14.0	37.2	35.5	
- Contributor	9.4	10.8	34.0	36.3	
- Did not participate	83.6	75.2	28.9	28.2	9,312
Marital status in 2011					
- Married, spouse working	59.1	62.3	75.4	80.1	
- Married, spouse not working	34.3	19.0	15.8	8.8	
- Married, spouse working status unknown	3.1	6.4	1.5	1.9	
- Separated/divorced	0.8	3.5	1.1	0.5	
- Widowed	2.3	8.5	4.7	8.6	
- Never married	0.3	0.3	1.6	0.2	9,312
Marital status in 2015					
- Married, spouse working	48.1	62.0	66.2	70.1	
- Married, spouse not working	45.7	21.4	23.4	14.0	
- Married, spouse working status unknown	2.3	2.9	1.5	2.1	
- Separated/divorced	0.6	2.3	0.9	0.4	
- Widowed	3.0	11.1	6.7	13.3	
- Never married	0.3	0.3	1.4	0.1	9,312
Material transfer with family members- children/parents in 2011 (percentage)					
- No transfer	50.9	51.4	44.9	43.2	
- Receive only	15.9	17.0	26.5	30.3	9,312

	Urban men	Urban women	Rural men	Rural women	Valid N
- Give transfer only	26.3	25.5	18.6	17.0	
- Both directions	7.0	6.1	10.0	9.6	
Care provision to grandchildren in 2011 (percentage)					
- No care provision	73.6	76.6	65.4	63.6	
- Less than 10 hours per week	5.5	6.7	7.9	8.9	
- More than 10 hours but no more than 20 hours per week	1.6	0.9	3.2	3.9	
- More than 20 hours per week	19.4	15.8	23.5	23.5	9,302
Care provision to grandchildren in 2015 (percentage)					
- No care provision	64.6	64.3	61.8	52.9	
- Less than 10 hours per week	9.8	6.7	9.5	9.9	
- More than 10 hours but no more than 20 hours per week	3.4	2.6	4.3	4.7	
- More than 20 hours per week	22.2	26.3	24.5	32.6	9,309
Any alive parents in 2011 (percentage)-	57.4	63.5	50.9	48.5	9300
Any alive parents in 2015 (percentage)-	50.6	56.4	41.2	38.8	9309

Note: 1) Imputation is applied to household expenditure (see Sections 3.6.1.3). The material transfers in 2015 not reported as the scope is slightly different. The 2015 questionnaire asked about all children and parents but the previous waves only asked about non-co-resident children and parents.
Source: Author's own analysis using data from CHARLS Wave 2011 & 2015.

Table A.5 Sample Profile (Sample C, N=7,813)

	Urban men	Urban women	Rural men	Rural women
Number of observations	960	999	2,825	3,029
Age at interview				
	NA	28.3	NA	NA
60-64	32.2	24.5	38.8	39.4
65-69	26.3	17.9	25.6	25.1
70-74	19.6	14.4	17.6	16.4
75 and over	22	14.8	18.0	19.1
Highest educational attainment				
-No formal education	5.7	20	21.9	59.9
-Did not finish primary school	12.9	13.3	27.7	20.6
-Primary School	24.2	24.5	32.4	15.1
-Junior School	27.6	24.2	14.4	3.9
-High school and above	29.6	18.1	3.6	0.5
Marital status				
-Married	92.8	73.2	86.7	74.2
-Separated or divorced	1.5	1.3	1	0.5
-Widowed	5.3	25.5	10.2	25.1
-Never married	0.4	0	2.1	0.2
Entitlements of the Occupational Pension Programme				
Recipient	76.8	61.4	4.2	1
Contributor	5.5	1.9	1.6	0.5
Neither	17.7	36.7	94.3	98.5

Source: Author's own analysis using the CHARLS 2014 Life History Wave.

Table A.6 Profiles of respondents from the CHARLS: Distribution of key personal characteristics, with and without weight (percentage)

	Wave 1 (2011)			Wave 2 (2013)			Wave 3 (2015)		
	Without adjustment	With adjustment	Difference	Without adjustment	With adjustment	Difference	Without adjustment	With adjustment	Difference
Age group									
45-49	20.1%	21.1%	-1.0%	15.3%	16.1%	-0.9%	19.3%	19.5%	-0.2%
50-54	14.9%	14.6%	0.2%	17.0%	16.8%	0.2%	16.9%	16.6%	0.2%
55-59	20.7%	20.0%	0.7%	18.5%	18.3%	0.2%	18.4%	18.0%	0.4%
60-64	16.8%	15.5%	1.3%	18.5%	17.2%	1.3%	17.9%	17.4%	0.5%
65-69	10.7%	10.1%	0.7%	12.3%	11.5%	0.8%	11.6%	11.2%	0.4%
70-74	7.9%	8.1%	-0.2%	8.4%	8.3%	0.1%	8.1%	8.0%	0.1%
75 and over	8.9%	10.6%	-1.7%	10.0%	11.8%	-1.7%	7.8%	9.2%	-1.4%
Gender									
Male	48.9%	48.3%	0.6%	48.6%	48.7%	-0.1%	49.2%	49.2%	0.0%
Female	51.1%	51.7%	-0.6%	51.4%	51.3%	0.1%	50.8%	50.8%	0.0%
Hukou status									
Non-agricultural	22.1%	28.5%	-6.4%	22.7%	29.0%	-6.3%	23.0%	29.3%	-6.3%
Agricultural	77.9%	71.5%	6.4%	77.3%	71.0%	6.3%	77.0%	70.7%	6.3%
Educational attainment									
Illiterate	26.8%	25.4%	1.4%	25.9%	24.0%	1.9%	26.1%	24.3%	1.8%
Did not finish primary school	17.9%	16.7%	1.2%	18.3%	17.1%	1.2%	17.9%	16.8%	1.1%
Primary school	21.5%	21.2%	0.3%	21.3%	21.1%	0.2%	21.5%	21.4%	0.1%
Middle school	20.9%	21.4%	-0.5%	21.2%	21.6%	-0.4%	21.3%	21.7%	-0.4%
High school and above	12.9%	15.3%	-2.4%	13.2%	16.2%	-3.0%	13.2%	15.8%	-2.6%
Marital status									
Married	87.1%	85.4%	1.7%	87.0%	85.3%	1.8%	86.5%	85.5%	1.0%
Divorced/Seperated	1.3%	1.6%	-0.3%	1.2%	1.5%	-0.3%	1.1%	1.2%	0.0%
Widowed	10.7%	11.9%	-1.3%	11.0%	12.4%	-1.4%	11.7%	12.5%	-0.9%
Never married	0.9%	1.1%	-0.2%	0.8%	0.9%	-0.1%	0.7%	0.8%	0.0%
Pension status of the OPP									
Recipient	12.2%	16.2%	-4.0%	15.3%	19.3%	-4.0%	15.0%	20.0%	-5.0%
Contributor	5.9%	7.3%	-1.4%	6.1%	7.0%	-0.9%	4.9%	6.5%	-1.6%
Neither	81.9%	76.5%	5.4%	78.6%	73.7%	4.9%	80.1%	73.5%	6.6%

Source: Author's own analysis using data from the CHARLS Waves 1-3.

Table A.7 Correlations between explanatory variables (Sample A)

a) Urban men

	Age group	Have any IADL difficulties	Have any ADL difficulties	Have any chronic illnesses	Educational attainment	Quntiles of annual household expenditure per capita	Housing characteristics	Recipients of the Occupational Pensions	Recipients of the Residents' Social Pension Programme	Region	Marital status and spouse working status	Spouse having any IADL difficulties	Spouses are recipients of the Occupational Pensions	Number of surviging children (categorical)	Any grandchildren under age 16	Transfer with children	Status of care provision to grandchildren	Any surving parents	Transfer with children	Status of care provision to parents
Age group	1																			
Have any IADL difficulties	0.2462*	1																		
Have any ADL difficulties	0.2155*	0.5388*	1																	
Have any chronic illnesses	0.1773*	0.1664*	0.1288*	1																
Educational attainment	-0.2820*	-0.1589*	-0.1545*	-0.0633*	1															
Quntiles of annual household expenditure per capita	0.0288	-0.0655*	-0.0622*	0.0114	0.1999*	1														
Housing characteristics	-0.0324	-0.0810*	-0.0742*	-0.0131	0.1328*	0.0547*	1													
Recipients of the Occupational Pensions	0.6487*	0.1492*	0.0986*	0.1301*	-0.1115*	0.1001*	0.0118	1												
Recipients of the Residents' Social Pension Programme	0.1581*	0.0720*	0.0656*	0.0137	-0.1816*	-0.0635*	-0.0536*	-0.1383*	1											
Region	0.0335	0.0416	0.0725*	0.0426	-0.1130*	-0.0950*	-0.0587*	-0.0126	0.0459	1										
Marital status and spouse working status	0.3757*	0.1032*	0.0715*	0.0478*	-0.1025*	0.0911*	0.0009	0.2584*	0.0097	-0.0084	1									
Spouse having any IADL difficulties	0.2193*	0.1298*	0.1238*	0.0722*	-0.1644*	-0.0032	-0.0765*	0.1210*	0.0669*	0.0409	0.3744*	1								
Spouses are recipients of the Occupational Pensions	0.1447*	-0.0191	-0.0334	-0.0064	0.1343*	0.1890*	0.1256*	0.2592*	-0.1065*	-0.1164*	0.2187*	-0.1684*	1							
Number of surviging children (categorical)	0.5435*	0.1502*	0.1665*	0.1241*	-0.2623*	-0.1554*	-0.0847*	0.2780*	0.1028*	0.1229*	0.1121*	0.1522*	-0.2047*	1						
Any grandchildren under age 16	0.3321*	0.0477*	0.0365	0.1102*	-0.1527*	-0.0614*	0.008	0.2457*	0.0862*	0.0970*	0.0984*	0.0488*	-0.0098	0.3988*	1					
Transfer with children	0.3353*	0.0754*	0.0859*	0.0715*	-0.0767*	0.0541*	-0.0025	0.2652*	0.0034	0.0366	0.0775*	0.0769*	0.0165	0.3742*	0.3149*	1				
Status of care provision to grandchildren	0.1004*	-0.0645*	-0.0375	0.0401	-0.0463	-0.0669*	0.0959*	0.1373*	0.0112	0.0889*	0.0519*	-0.0612*	0.0488*	0.0939*	0.5193*	0.0736*	1			
Any surving parents	-0.5813*	-0.1275*	-0.1231*	-0.1258*	0.2201*	0.0029	0.0660*	-0.3694*	-0.1042*	-0.0038	-0.2530*	-0.1723*	-0.0381	-0.3541*	-0.2251*	-0.2273*	-0.0574*	1		
Transfer with children	-0.4784*	-0.1231*	-0.1399*	-0.0878*	0.1965*	0.0548*	0.0848*	-0.3051*	-0.0877*	0.0191	-0.2400*	-0.1598*	-0.0429	-0.2996*	-0.1954*	-0.1104*	-0.0597*	0.7794*	1	
Status of care provision to parents	-0.3330*	-0.0981*	-0.0666*	-0.0990*	0.1987*	0.0772*	0.0307	-0.2219*	-0.0657*	-0.0309	-0.1586*	-0.1383*	0.0109	-0.2754*	-0.2183*	-0.1362*	-0.0786*	0.4359*	0.4268*	1

b) Urban women

	Age group	Have any IADL difficulties	Have any ADL difficulties	Have any chronic illnesses	Educational attainment	Quntiles of annual household expenditure per capita	Housing characteristics	Recipients of the Occupational Pensions	Recipients of the Residents' Social Pension Programme	Region	Marital status and spouse working status	Spouse having any IADL difficulties	Spouses are recipients of the Occupational Pensions	Number of surviging children (categorical)	Any grandchildren under age 16	Transfer with children	Status of care provision to grandchildren	Any surving parents	Transfer with children	Status of care provision to parents
Age group	1																			
Have any IADL difficulties	0.2527*	1																		
Have any ADL difficulties	0.2580*	0.4917*	1																	
Have any chronic illnesses	0.2094*	0.1730*	0.1598*	1																
Educational attainment	-0.3716*	-0.2400*	-0.1923*	-0.1142*	1															
Quntiles of annual household expenditure per capita	0.0262	-0.0609*	-0.0389	0.0258	0.2285*	1														
Housing characteristics	-0.0495*	-0.0404	-0.0545*	-0.0463	0.0728*	0.0613*	1													
Recipients of the Occupational Pensions	0.2787*	-0.0601*	0.00310	0.0922*	0.2086*	0.2090*	0.0703*	1												
Recipients of the Residents' Social Pension Programme	0.2177*	0.0936*	0.1122*	0.0438	-0.2506*	-0.1084*	-0.0402	-0.2898*	1											
Region	0.0186	0.0576*	0.0455	0.0597*	-0.1158*	-0.1168*	-0.0722*	-0.1267*	0.1225*	1										
Marital status and spouse working status	0.5563*	0.1941*	0.1758*	0.0987*	-0.2000*	0.00330	-0.0406	0.1740*	0.0792*	0.00100	1									
Spouse having any IADL difficulties	0.3894*	0.1962*	0.1749*	0.0800*	-0.2101*	-0.0516*	-0.1000*	0.00120	0.0826*	0.0317	0.7070*	1								
Spouses are recipients of the Occupational Pensions	0.3715*	0.0570*	0.0525*	0.0807*	-0.0558*	0.0949*	0.0463	0.3288*	0.0177	-0.0127	0.0708*	-0.2130*	1							
Number of surviging children (categorical)	0.5550*	0.2146*	0.2045*	0.1332*	-0.4478*	-0.1515*	-0.0778*	-0.0799*	0.1948*	0.1371*	0.2915*	0.2501*	0.1002*	1						
Any grandchildren under age 16	0.3252*	0.1156*	0.1023*	0.1040*	-0.2452*	-0.0542*	0.00790	0.0622*	0.1333*	0.1078*	0.1438*	0.0489	0.1889*	0.3646*	1					
Transfer with children	0.3337*	0.1016*	0.1268*	0.0967*	-0.1447*	0.0486	-0.0171	0.0714*	0.1123*	0.0611*	0.1260*	0.0628*	0.1806*	0.3791*	0.2884*	1				
Status of care provision to grandchildren	0.0445	-0.0196	0.00800	0.0720*	-0.0840*	-0.0985*	0.1097*	0.0487	0.0761*	0.0791*	0.00910	-0.0976*	0.1240*	0.0662*	0.5726*	0.1020*	1			
Any surving parents	-0.5881*	-0.1497*	-0.1892*	-0.1206*	0.3131*	0.00760	0.0852*	-0.1206*	-0.1673*	-0.0124	-0.3693*	-0.2324*	-0.2170*	-0.3687*	-0.2084*	-0.2249*	-0.0317	1		
Transfer with children	-0.4914*	-0.1278*	-0.1488*	-0.0866*	0.2826*	0.0550*	0.0958*	-0.1109*	-0.1517*	0.0150	-0.3383*	-0.2098*	-0.1759*	-0.3037*	-0.1825*	-0.1086*	-0.0270	0.7872*	1	
Status of care provision to parents	-0.3603*	-0.1422*	-0.1179*	-0.1054*	0.2798*	0.0866*	0.0187	-0.0456	-0.0969*	-0.0184	-0.2304*	-0.1379*	-0.1586*	-0.3062*	-0.2555*	-0.1421*	-0.0915*	0.4499*	0.4347*	1

c) Rural men

	Age group	Have any IADL difficulties	Have any ADL difficulties	Have any chronic illnesses	Educational attainment	Quntiles of annual household expenditure per capita	Housing characteristics	Recipients of the Occupational Pensions	Recipients of the Residents' Social Pension Programme	Region	Marital status and spouse working status	Spouse having any IADL difficulties	Spouses are recipients of the Occupational Pensions	Number of surviging children (categorical)	Any grandchildren under age 16	Transfer with children	Status of care provision to grandchildren	Any surving parents	Transfer with children	Status of care provision to parents
Age group	1																			
Have any IADL difficulties	0.2331*	1																		
Have any ADL difficulties	0.2195*	0.5260*	1																	
Have any chronic illnesses	0.1209*	0.1210*	0.1433*	1																
Educational attainment	-0.4042*	-0.1775*	-0.1408*	-0.0741*	1															
Quntiles of annual household expenditure per capita	-0.1141*	-0.0499*	-0.0457*	-0.0254	0.0819*	1														
Housing characteristics	-0.2072*	-0.0985*	-0.1156*	-0.0659*	0.1164*	0.0492*	1													
Recipients of the Occupational Pensions	0.1242*	-0.0166	-0.0185	0.0117	0.0392*	0.0723*	-0.0152	1												
Recipients of the Residents' Social Pension Programme	0.6525*	0.1690*	0.1605*	0.0986*	-0.2907*	-0.1009*	-0.1600*	-0.0644*	1											
Region	0.0424*	0.0899*	0.1047*	0.0960*	-0.0924*	-0.0274*	-0.1060*	-0.0416*	0.0939*	1										
Marital status and spouse working status	0.2725*	0.0879*	0.0698*	0.0423*	-0.1754*	0.0297*	-0.0692*	0.0580*	0.1693*	-0.0341*	1									
Spouse having any IADL difficulties	0.2666*	0.1890*	0.1749*	0.0616*	-0.2058*	-0.00970	-0.1428*	0.00730	0.1989*	0.1118*	0.5232*	1								
Spouses are recipients of the Occupational Pensions	0.00910	-0.0256	-0.0294*	0.00340	0.0522*	0.0647*	0.0302*	0.2179*	-0.0411*	-0.0525*	0.0432*	-0.0434*	1							
Number of surviging children (categorical)	0.4674*	0.1409*	0.1148*	0.0738*	-0.1563*	-0.0992*	-0.1251*	0.0316*	0.3406*	0.1145*	0.0770*	0.0810*	-0.0314*	1						
Any grandchildren under age 16	0.2457*	0.0388*	0.0563*	0.0487*	-0.0708*	-0.0573*	-0.0490*	0.0207	0.1658*	0.0323*	-0.0211	-0.0416*	0.0112	0.3259*	1					
Transfer with children	0.1907*	0.0350*	0.0575*	0.0621*	-0.0129	0.0610*	-0.0771*	0.0258	0.1538*	0.0972*	-0.0570*	-0.00800	0.0148	0.2909*	0.2583*	1				
Status of care provision to grandchildren	-0.00360	-0.0229	-0.0294*	0.00820	0.0231	-0.0520*	0.0565*	0.00430	0.0214	0.0748*	-0.0759*	-0.0557*	0.0128	0.0468*	0.3698*	0.0688*	1			
Any surving parents	-0.5516*	-0.1672*	-0.1400*	-0.0794*	0.2589*	0.0502*	0.1289*	-0.0464*	-0.3762*	-0.0563*	-0.2048*	-0.2355*	-0.00990	-0.2535*	-0.1250*	-0.1296*	0.0347*	1		
Transfer with children	-0.4640*	-0.1480*	-0.1234*	-0.0618*	0.2353*	0.0742*	0.1110*	-0.0440*	-0.3145*	-0.0513*	-0.1886*	-0.2105*	-0.0181	-0.1906*	-0.0962*	-0.0443*	0.0301*	0.7797*	1	
Status of care provision to parents	-0.2414*	-0.0640*	-0.0506*	-0.0336*	0.1296*	0.0250	0.0537*	-0.0239	-0.1699*	-0.0295*	-0.0889*	-0.0871*	0.00400	-0.1325*	-0.1052*	-0.0497*	0.00280	0.3401*	0.3181*	1

d) Rural women

	Age group	Have any IADL difficulties	Have any ADL difficulties	Have any chronic illnesses	Educational attainment	Quntiles of annual household expenditure per capita	Housing characteristics	Recipients of the Occupational Pensions	Recipients of the Residents' Social Pension Programme	Region	Marital status and spouse working status	Spouse having any IADL difficulties	Spouses are recipients of the Occupational Pensions	Number of surviging children (categorical)	Any grandchildren under age 16	Transfer with children	Status of care provision to grandchildren	Any surving parents	Transfer with children	Status of care provision to parents
Age group	1																			
Have any IADL difficulties	0.2173*	1																		
Have any ADL difficulties	0.1976*	0.4565*	1																	
Have any chronic illnesses	0.1600*	0.1611*	0.1820*	1																
Educational attainment	-0.4012*	-0.1734*	-0.0987*	-0.0610*	1															
Quntiles of annual household expenditure per capita	-0.0994*	-0.0602*	-0.0416*	-0.00120	0.1080*	1														
Housing characteristics	-0.1988*	-0.1136*	-0.1052*	-0.0774*	0.1500*	0.0498*	1													
Recipients of the Occupational Pensions	0.0329*	-0.00650	-0.0109	0.0138	0.0174	0.0427*	0.0250	1												
Recipients of the Residents' Social Pension Programme	0.6546*	0.1389*	0.1295*	0.1128*	-0.2500*	-0.0545*	-0.1441*	-0.0501*	1											
Region	0.00520	0.1129*	0.0787*	0.0747*	-0.0305*	-0.0199	-0.0827*	-0.0571*	0.0423*	1										
Marital status and spouse working status	0.4510*	0.1240*	0.1272*	0.0724*	-0.1819*	-0.0365*	-0.0597*	0.0249	0.2821*	0.0189	1									
Spouse having any IADL difficulties	0.3994*	0.1825*	0.1748*	0.0855*	-0.2018*	-0.0529*	-0.0996*	-0.0212	0.2707*	0.0804*	0.7196*	1								
Spouses are recipients of the Occupational Pensions	0.1578*	0.00310	0.00710	0.0397*	0.00240	0.0923*	-0.00530	0.1420*	0.1161*	-0.0155	0.0590*	-0.0759*	1							
Number of surviging children (categorical)	0.5301*	0.1585*	0.1430*	0.1011*	-0.2628*	-0.0865*	-0.1510*	-0.0190	0.3816*	0.1027*	0.2918*	0.2653*	0.0627*	1						
Any grandchildren under age 16	0.2409*	0.0408*	0.0478*	0.0658*	-0.1626*	-0.0568*	-0.0552*	0.00570	0.1355*	0.0321*	0.0518*	0.0579*	0.0463*	0.2720*	1					
Transfer with children	0.2009*	0.0435*	0.0874*	0.0781*	-0.0700*	0.0736*	-0.0864*	0.00530	0.1345*	0.0939*	0.0367*	0.0508*	0.0695*	0.2663*	0.2173*	1				
Status of care provision to grandchildren	-0.0706*	-0.0345*	-0.0251	0.00390	-0.00280	-0.0445*	0.0875*	0.000800	-0.0683*	0.0529*	-0.0727*	-0.0542*	0.00270	-0.0432*	0.3944*	0.0358*	1			
Any surving parents	-0.5664*	-0.1642*	-0.1436*	-0.1039*	0.2543*	0.0478*	0.1223*	-0.00790	-0.3929*	-0.0497*	-0.2977*	-0.2716*	-0.0823*	-0.3226*	-0.1452*	-0.1406*	0.0664*	1		
Transfer with children	-0.4772*	-0.1427*	-0.1230*	-0.0838*	0.2274*	0.0726*	0.1026*	-0.0165	-0.3200*	-0.0468*	-0.2673*	-0.2442*	-0.0754*	-0.2639*	-0.1259*	-0.0613*	0.0548*	0.7879*	1	
Status of care provision to parents	-0.2486*	-0.0608*	-0.0491*	-0.0592*	0.1363*	0.0295*	0.0449*	0.0108	-0.1547*	-0.0338*	-0.1209*	-0.1115*	-0.0335*	-0.1606*	-0.0975*	-0.0510*	0.0301*	0.3540*	0.3306*	1

Note: * indicates significant association detected at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Table A.8 Selected personal characteristics by cluster membership (mean value and percentage)

a) Urban men, N=960

Cluster	N	Average age (in 2014)	Number of children	Age at first childbirth	Finish middle school (%)	Participants of the Occupational Pension Programme (%)	Father's literacy (%)
Type 1 Limited economic activities	44	67.5	2.4	27.4	43.2	50.0	46.0
Type 2 Long-term agricultural work	56	69.3	3.1	26.3	12.5	32.1	40.7
Type 3 Long-term multiple jobs	26	67.8	3.4	24.9	46.2	69.2	50.0
Type 4 Long-term self-employment	32	68.2	3.2	26.3	34.4	25.0	48.2
Type 5 Long-term Bianzhi employment	212	71	3.0	26.3	74.5	93.4	50.0
Type 6 Bianzhi employment with other early experiences	70	69	2.6	26.8	78.6	97.1	46.3
Type 7 Long-term ordinary employment	429	68.6	2.6	26.8	55.0	90.8	47.1
Type 8 Ordinary employment with other early experiences	56	68.9	2.6	28.4	58.9	70.9	41.5
Type 9 Mid-life career transformation	35	66.5	2.8	25.2	37.1	80.0	28.1

b) Urban women, N=999

Cluster	N	Average age (in 2014)	Number of children	Age at first childbirth	Finish middle school (%)	Participants of the Occupational Pension Programme (%)	Father's literacy (%)
Type 1 Limited economic activities	129	65.4	2.9	23.7	28.7	35.2	40.5
Type 2 Long-term agricultural work	135	66.0	3.2	23.1	13.3	12.7	38.3
Type 3 Agricultural work & ordinary employment	69	66.0	3.1	23.2	24.6	27.9	39.1
Type 4 Long-term self-employment	30	62.8	2.7	24.3	40.0	26.7	42.9
Type 5 Long-term Bianzhi employment	103	65.4	2.2	25.4	83.5	98.0	65.2
Type 6 Bianzhi employment with other early experiences	35	67.0	2.6	24.5	60.0	94.1	43.3
Type 7 Long-term ordinary employment	357	64.3	2.1	24.9	62.5	86.4	54.6
Type 8 Ordinary employment with other early experiences	121	68.1	2.9	23.9	43.8	71.4	48.7
Type 9 Mid-life career transformation	20	63.1	2.1	25.8	60.0	80.0	75.0

c) Rural men, N=2,825

Cluster	N	Average age (in 2014)	Number of children	Age at first childbirth	Finish middle school (%)	Participants of the Occupational Pension Programme (%)	Father's literacy (%)
Type 1 Long-term agricultural work	1,738	68.3	3.6	25.6	11.9	2.1	28.1
Type 2 Long-term multiple jobs	196	67.3	3.3	25.0	27.6	8.7	40.0
Type 3 Agricultural work & Multiple jobs	198	63.4	2.9	25.3	26.3	3.6	38.7
Type 4 Multiple jobs in middle years	126	68.3	3.4	25.0	27.0	6.3	29.3
Type 5 Long-term employment	194	67.2	3.1	25.2	41.2	37.4	40.4
Type 6 Ordinary employment & agricultural work	90	68.2	3.4	25.9	27.8	10.0	37.2
Type 7 Long-term self-employment	73	68.6	3.2	26.2	20.6	8.2	40.0
Type 8 Agricultural work & inactivity	111	70.2	3.3	25.2	18.9	5.4	33.0
Type 9 Limited economic activities	99	71.9	3.5	26.5	10.1	3.0	25.3

d) Rural women, N=3,029

Cluster	N	Average age (in 2014)	Number of children	Age at first childbirth	Finish middle school (%)	Participants of the Occupational Pension Programme (%)	Father's literacy (%)
C1 Long-term agricultural work	2,270	68.0	4.0	22.8	3.6	0.9	30.3
C2 Agricultural work & inactivity	261	69.2	4.0	22.7	4.2	3.1	29.6
C3 Inactivity & agricultural work	59	71.2	4.5	23.6	1.7	1.7	24.5
C4 Long-term multiple jobs	78	67.4	3.5	23.5	6.4	0.0	45.1
C5 Limited economic activities	288	69.6	3.9	23.7	5.9	2.1	22.7
C6 Long-term self-employment	32	67.1	3.5	22.6	12.5	3.2	51.7
C7 Long-term employment	41	68.9	3.6	23.4	24.4	22.5	41.7

Source: Author’s own analysis using data from the CHARLS Life History Wave.

Table A.9 Distribution of cluster membership by age cohort

a) Urban men, N=960

Cluster	60-64	65-69	70-74	75+
Type 1 Limited economic activities	6.8	4.0	3.7	2.8
Type 2 Long-term agricultural work	4.9	7.1	5.9	5.7
Type 3 Long-term multiple jobs	3.9	1.6	3.7	1.4
Type 4 Long-term self-employment	3.9	3.2	3.7	2.4
Type 5 Long-term Bianzhi employment	14.6	20.6	26.1	31.3
Type 6 Bianzhi employment with other early experiences	5.2	9.5	8.5	6.6
Type 7 Long-term ordinary employment	49.8	43.7	39.9	42.7
Type 8 Ordinary employment with other early experiences	5.8	6.4	5.9	5.2
Type 9 Mid-life career transformation	5.2	4.0	2.7	1.9
Total	100	100	100	100

b) Urban women, N=999

Cluster	55-59	60-64	65-69	70-74	75+
Type 1 Limited economic activities	15.2	11.4	11.7	7.6	17.6
Type 2 Long-term agricultural work	13.1	11.4	15.1	15.3	14.2
Type 3 Agricultural work & ordinary employment	3.5	6.5	14.0	9.0	3.4
Type 4 Long-term self-employment	4.6	3.7	2.2	1.4	1.4
Type 5 Long-term Bianzhi employment	9.9	11.8	7.8	10.4	11.5
Type 6 Bianzhi employment with other early experiences	1.8	3.3	6.7	4.9	2.0
Type 7 Long-term ordinary employment	40.6	39.2	29.1	37.5	27.0
Type 8 Ordinary employment with other early experiences	8.8	11.0	10.1	12.5	22.3
Type 9 Mid-life career transformation	2.5	1.6	3.4	1.4	0.7
Total	100	100	100	100	100

c) Rural men, N=2,825

Cluster	60-64	65-69	70-74	75+
Type 1 Long-term agricultural work	56.9	64.4	65.3	63.8
Type 2 Long-term multiple jobs	7.2	7.5	7.0	5.5
Type 3 Agricultural work & Multiple jobs	13.6	5.1	1.0	1.4
Type 4 Multiple jobs in middle years	4.2	4.0	5.2	4.9
Type 5 Long-term employment	8.5	6.5	5.0	5.7
Type 6 Ordinary employment & agricultural work	2.7	3.7	3.6	3.2
Type 7 Long-term self-employment	2.5	2.2	3.2	2.8
Type 8 Agricultural work & inactivity	1.9	4.6	5.8	5.5
Type 9 Limited economic activities	2.6	2.1	3.8	7.3
Total	100	100	100	100

d) Rural women, N=3,029

Cluster	60-64	65-69	70-74	75+
C1 Long-term agricultural work	76.9	76.8	75.1	68.4
C2 Agricultural work & inactivity	7.4	9.0	8.7	10.7
C3 Inactivity & agricultural work	0.9	1.6	3.0	3.6
C4 Long-term multiple jobs	3.3	2.2	1.6	2.4
C5 Limited economic activities	8.7	8.4	9.1	13.0
C6 Long-term self-employment	1.6	0.3	1.4	0.7
C7 Long-term employment	1.3	1.7	1.2	1.2
Total	100	100	100	100

Source: Author's own analysis using the CHARLS 2014 Life History Wave.

Table A.10 Logistic Regression Results using the prevalence of ADL difficulties as the alternative indicators for health status

VARIABLES	A11 Urban men	A12 Urban women	A13 Rural men	A14 Rural women
Age group (Reference group: 45-49)				
50-54	0.51*	0.66*	0.73	0.78*
	(0.275 - 0.939)	(0.445 - 0.973)	(0.502 - 1.048)	(0.629 - 0.975)
55-59	0.23***	0.27***	0.57**	0.61***
	(0.131 - 0.415)	(0.179 - 0.406)	(0.404 - 0.804)	(0.489 - 0.756)
60-64	0.11***	0.20***	0.41***	0.49***
	(0.060 - 0.197)	(0.126 - 0.305)	(0.287 - 0.579)	(0.385 - 0.614)
65-69	0.11***	0.18***	0.22***	0.34***
	(0.056 - 0.196)	(0.108 - 0.299)	(0.154 - 0.321)	(0.261 - 0.438)
70+	0.04***	0.05***	0.09***	0.11***
	(0.023 - 0.081)	(0.031 - 0.093)	(0.061 - 0.123)	(0.085 - 0.142)
Have any ADL difficulties	0.46***	0.73*	0.31***	0.56***
	(0.315 - 0.660)	(0.498 - 1.076)	(0.263 - 0.370)	(0.486 - 0.639)
Have any chronic illnesses	1.06	0.79	0.71***	0.75***
	(0.831 - 1.356)	(0.614 - 1.023)	(0.610 - 0.835)	(0.660 - 0.852)
Educational attainment (Ref. group: No formal education)				
Did not finish primary school	1.08	0.74	1.38**	0.91
	(0.678 - 1.734)	(0.466 - 1.179)	(1.113 - 1.720)	(0.783 - 1.062)
Finish primary school	1.10	0.68	1.43***	0.87
	(0.747 - 1.619)	(0.448 - 1.020)	(1.157 - 1.764)	(0.739 - 1.031)
Finish middle school	0.97	0.66*	1.37**	0.87
	(0.677 - 1.376)	(0.457 - 0.954)	(1.083 - 1.735)	(0.708 - 1.057)
High school or above	0.87	0.66*	1.31	0.86
	(0.608 - 1.247)	(0.449 - 0.970)	(0.933 - 1.831)	(0.604 - 1.219)
No house ownership	0.87	0.85	0.99	0.84*
	(0.644 - 1.189)	(0.619 - 1.178)	(0.809 - 1.215)	(0.710 - 0.984)
Quintile of household expenditure per capita (Ref. group: Lowest 20%)				
60%-80%	0.86	1.16	1.24	0.96
	(0.605 - 1.228)	(0.805 - 1.682)	(0.996 - 1.538)	(0.804 - 1.142)
40%-60%	0.79	1.05	1.26*	0.91
	(0.555 - 1.118)	(0.723 - 1.519)	(1.009 - 1.571)	(0.763 - 1.089)
20%-40%	0.85	1.05	1.26*	1.06
	(0.598 - 1.211)	(0.716 - 1.546)	(1.006 - 1.574)	(0.887 - 1.273)
Top 20%	0.82	0.89	1.10	0.83*
	(0.574 - 1.177)	(0.608 - 1.309)	(0.876 - 1.376)	(0.696 - 0.998)
Receive Occupational Pensions	0.27***	0.25***	0.59***	0.50***
	(0.203 - 0.367)	(0.188 - 0.328)	(0.433 - 0.796)	(0.335 - 0.757)
Receive Residents' Social Pensions	1.37	0.99	1.07	0.98
	(0.842 - 2.231)	(0.666 - 1.480)	(0.884 - 1.295)	(0.834 - 1.154)
Region (Ref. group: Eastern)				
Central	1.43*	1.02	1.48***	1.20*
	(1.088 - 1.887)	(0.763 - 1.371)	(1.235 - 1.776)	(1.042 - 1.382)
Western	1.11	0.85	1.58***	1.51***
	(0.848 - 1.455)	(0.635 - 1.133)	(1.332 - 1.886)	(1.318 - 1.734)
Observations	2,023	1,818	6,236	6,919

Note: The star symbols indicate the p-values for ORs, where *** represents p<0.001, ** represents p<0.01, * represents p<0.05.
Source: Author's own analysis using data from the CHARLS Wave 2.

Table A.11 Full results of Model A2

VARIABLES	A2.1 Urban men	A2.2 Urban women	A2.3 Rural men	A2.4 Rural women
Age group (Reference group: 45-49)				
50-54	0.74 (0.371 - 1.465)	0.82 (0.531 - 1.262)	0.74 (0.480 - 1.143)	0.90 (0.712 - 1.143)
55-59	0.59 (0.306 - 1.155)	0.47** (0.290 - 0.747)	0.70 (0.459 - 1.063)	0.76* (0.599 - 0.970)
60-64	0.28*** (0.141 - 0.558)	0.51* (0.301 - 0.875)	0.52** (0.344 - 0.795)	0.69** (0.537 - 0.877)
65-69	0.27*** (0.133 - 0.563)	0.51* (0.283 - 0.935)	0.34*** (0.222 - 0.525)	0.56*** (0.427 - 0.726)
70+	0.14*** (0.067 - 0.284)	0.18*** (0.095 - 0.351)	0.17*** (0.111 - 0.257)	0.20*** (0.150 - 0.257)
Have any IADL difficulties	0.21*** (0.137 - 0.327)	0.52** (0.339 - 0.793)	0.19*** (0.161 - 0.234)	0.36*** (0.318 - 0.419)
Have any chronic illnesses	1.03 (0.781 - 1.354)	0.72* (0.541 - 0.948)	0.68*** (0.573 - 0.817)	0.77*** (0.673 - 0.884)
Educational attainment (Ref. group: no formal education)				
Did not finish primary school	0.71 (0.357 - 1.407)	1.24 (0.721 - 2.131)	1.33* (1.042 - 1.692)	0.92 (0.781 - 1.079)
Finish primary school	0.70 (0.374 - 1.327)	0.94 (0.575 - 1.534)	1.28* (1.008 - 1.615)	0.80* (0.675 - 0.959)
Finish middle school	0.67 (0.363 - 1.246)	1.06 (0.654 - 1.707)	1.14 (0.879 - 1.483)	0.84 (0.673 - 1.036)
High school or above	0.58 (0.314 - 1.077)	1.32 (0.802 - 2.171)	0.97 (0.677 - 1.400)	0.79 (0.546 - 1.143)
No house ownership	1.04 (0.736 - 1.456)	0.90 (0.635 - 1.271)	0.95 (0.761 - 1.195)	0.85 (0.710 - 1.009)
Quintiles of household expenditure per capita (Ref. group: Lowest 20%)				
60%-80%	0.85 (0.578 - 1.256)	1.25 (0.844 - 1.858)	1.24 (0.973 - 1.582)	0.92 (0.765 - 1.116)
40%-60%	0.80 (0.538 - 1.178)	1.08 (0.717 - 1.625)	1.29* (1.007 - 1.641)	0.81* (0.673 - 0.980)
20%-40%	0.97 (0.650 - 1.437)	0.86 (0.568 - 1.312)	1.12 (0.877 - 1.432)	0.96 (0.794 - 1.161)
Top 20%	0.98 (0.654 - 1.471)	0.78 (0.510 - 1.189)	1.12 (0.875 - 1.435)	0.75** (0.625 - 0.912)
Receipt of the Occupational Pensions	0.29*** (0.211 - 0.403)	0.23*** (0.169 - 0.309)	0.65* (0.469 - 0.909)	0.58* (0.377 - 0.905)
Receipt of the Residents' Social Pensions	1.04 (0.607 - 1.786)	0.99 (0.651 - 1.515)	1.19 (0.968 - 1.472)	0.98 (0.829 - 1.161)
Region (Ref. group: Eastern)				
Central	1.35 (0.997 - 1.839)	1.07 (0.780 - 1.474)	1.33** (1.088 - 1.615)	1.21* (1.043 - 1.401)
Western	0.96 (0.713 - 1.300)	0.79 (0.578 - 1.081)	1.37** (1.132 - 1.662)	1.66*** (1.437 - 1.924)

(continued on the next page)

VARIABLES	A2.1 Urban men	A2.2 Urban women	A2.3 Rural men	A2.4 Rural women
Marital Status (Ref. group: Married, spouses working)				
Married, spouses not working	0.20*** (0.147 - 0.263)	0.19*** (0.139 - 0.272)	0.26*** (0.215 - 0.306)	0.28*** (0.240 - 0.332)
Separated/divorced	0.16*** (0.079 - 0.337)	0.67 (0.330 - 1.347)	0.43** (0.239 - 0.780)	0.45* (0.204 - 0.995)
Widowed	0.18*** (0.098 - 0.345)	0.33*** (0.207 - 0.524)	0.23*** (0.178 - 0.297)	0.37*** (0.309 - 0.437)
Intergenerational transfer (Ref. No transfer or both directions)				
Net recipient	1.10 (0.814 - 1.487)	0.92 (0.649 - 1.316)	0.78** (0.653 - 0.922)	0.77*** (0.675 - 0.884)
Net provider	1.59** (1.121 - 2.256)	1.07 (0.765 - 1.488)	1.41* (1.027 - 1.934)	0.72 (0.589 - 1.085)
Care provision to grandchildren (Ref. group: No care provision)				
Care provision to grandchildren: 0-10H/W	0.89 (0.579 - 1.354)	1.14 (0.720 - 1.820)	1.34 (0.993 - 1.814)	0.95 (0.759 - 1.187)
Care provision to grandchildren: 10-20H/W	1.11 (0.599 - 2.071)	0.38* (0.178 - 0.803)	1.11 (0.731 - 1.672)	1.24 (0.908 - 1.707)
Care provision to grandchildren: 20+H/W	0.79 (0.574 - 1.096)	0.61** (0.430 - 0.858)	1.05 (0.852 - 1.289)	0.73*** (0.632 - 0.841)
Care provision to parents (Ref. group: No care provision)				
Care provision to parents: 0-10H/W	1.69 (0.998 - 2.873)	0.96 (0.619 - 1.501)	1.54 (0.891 - 2.669)	1.09 (0.811 - 1.457)
Care provision to parents: 10-20H/W	1.58 (0.775 - 3.235)	1.59 (0.715 - 3.523)	0.86 (0.481 - 1.542)	1.12 (0.673 - 1.851)
Care provision to parents: 20+H/W	1.40 (0.563 - 3.483)	0.65 (0.314 - 1.363)	0.98 (0.422 - 2.255)	1.44 (0.805 - 2.589)
Pseudo R-square	0.357	0.301	0.275	0.196
Observations	1,817	1,714	5,578	6,542

Note: The star symbols indicate the p-values for ORs, where *** represents p<0.001, ** represents p<0.01, * represents p<0.05.

Source: Author's own analysis using data from the CHARLS Wave 2.

Table A.12 Full results of Model A3, by subgroup

	A3.1
VARIABLES	Urban men
Age group	
(Ref. group 60-64)	
65-69	1.03
	(0.660 - 1.619)
70-74	0.59*
	(0.348 - 0.999)
75 and over	0.31***
	(0.173 - 0.564)
Have any IDAL difficulties	0.22***
	(0.121 - 0.400)
Have any chronic illnesses	0.89
	(0.593 - 1.342)
Receipt of the Occupational Pensions	0.59*
	(0.380 - 0.905)
Marital status	
(Ref. group: Married, spouses working)	
Married, spouses not working	0.13***
	(0.089 - 0.195)
Separated	0.05***
	(0.011 - 0.256)
Widowed	0.18***
	(0.082 - 0.386)
Material transfers with family members	
(Ref. group: No transfers or both directions)	
Net recipient	1.02
	(0.696 - 1.507)
Net provider	1.09
	(0.607 - 1.958)
Care provision to grandchildren	
(Ref. group: No care provision)	
Less than 10 hours per week	0.63
	(0.342 - 1.153)
10-20 hours per week	0.58
	(0.234 - 1.462)
More than 20 hours per week	0.76
	(0.493 - 1.163)
Typology of work histories	
(Ref. group: Type 7 Long-term ordinary employment)	
Type 1 Limited economic activities	1.95
	(0.839 - 4.516)
Type 2 Long-term agricultural work	3.12**
	(1.460 - 6.658)
Type 3 Long-term multiple work	3.82**
	(1.435 - 10.152)
Type 4 Long-term self-employment	2.28
	(0.891 - 5.836)
Type 5 Long-term Bianzhi employment	0.95
	(0.587 - 1.526)
Type 6 Bianzhi employment with	1.15
Other early experiences	(0.571 - 2.303)
Type 8 Ordinary employment with other	2.29*
early experiences	(1.138 - 4.604)
Type 9 Mid-life career transformation	3.78**
	(1.510 - 9.447)
Observations	892

VARIABLES	A3.2 Urban women
Age group (Ref. group: 55-59)	
60-64	1.37 (0.837 - 2.248)
65-69	1.01 (0.549 - 1.864)
70-74	0.59 (0.282 - 1.216)
75 and over	0.26** (0.103 - 0.645)
Have any IADL difficulties	0.76 (0.447 - 1.308)
Have any chronic illnesses	0.67 (0.431 - 1.034)
Receipt of the occupational pensions	0.45** (0.273 - 0.754)
Marital status (Ref group: married, spouses working)	
Married, spouses not working	0.15*** (0.092 - 0.233)
Separated	1.08 (0.376 - 3.130)
Widowed	0.32*** (0.174 - 0.574)
Intergenerational transfers (Ref. group: No transfers or both directions)	
Net recipient	1.01 (0.658 - 1.553)
Net provider	1.38 (0.766 - 2.474)
Care provision to grandchildren (Ref. group: No care provision)	
Less than 10 hours per week	1.34 (0.733 - 2.442)
10-20 hours per week	0.71 (0.292 - 1.713)
More than 20 hours per week	0.65 (0.410 - 1.045)
Typology of work histories (Ref: Type 7 Long-term ordinary employment)	
Type 1 Limited economic activities	2.16* (1.116 - 4.191)
Type 2 Long-term agricultural work	3.84*** (1.956 - 7.524)
Type 3 Agricultural work & ordinary employment	2.92** (1.368 - 6.225)
Type 4 Long-term self-employment	1.84 (0.659 - 5.119)
Type 5 Long-term Bianzhi employment	1.77 (0.840 - 3.728)
Type 6 Bianzhi employment with other early experiences	2.06 (0.726 - 5.825)
Type 8 Ordinary employment with other early experiences	1.57 (0.769 - 3.217)
Type 9 Mid-life career transformation	13.76*** (4.421 - 42.861)
Observations	965

VARIABLES	A3.3 Rural men
Age group (Ref. group: 60-64)	
65-69	0.68** (0.513 - 0.907)
70-74	0.54*** (0.394 - 0.729)
75 and over	0.21*** (0.155 - 0.292)
Have any IADL difficulties	0.24*** (0.192 - 0.306)
Have any chronic illnesses	0.68** (0.543 - 0.863)
Educational attainment (Ref. group: No formal education)	
Did not finish primary school	1.43* (1.073 - 1.915)
Finish primary school	1.13 (0.853 - 1.500)
Finish middle school	1.03 (0.728 - 1.461)
High school and above	1.06 (0.568 - 1.959)
Household expenditure per capita (Ref. group: the lowest 20%)	
60%-80%	1.35 (0.995 - 1.830)
40%-60%	1.38* (1.012 - 1.879)
20%-40%	1.29 (0.940 - 1.768)
Top 20%	1.27 (0.917 - 1.761)
Receipt of the Occupational pensions	0.66 (0.392 - 1.098)
Region (Ref. group: Eastern)	
Central	1.32* (1.025 - 1.713)
Western	1.36* (1.062 - 1.749)
Marital status (Ref. group: Married, spouses working)	
Married, spouse not working	0.26*** (0.206 - 0.325)
Separated	0.92 (0.335 - 2.523)
Widowed	0.24*** (0.175 - 0.323)
Intergenerational transfers (Ref. group: No transfers or both directions)	
Net recipient	0.79* (0.642 - 0.983)
Net provider	1.46 (0.782 - 2.740)
Care provision to grandchildren (Ref. group: No care provision)	
Less than 10 hours per week	1.32 (0.882 - 1.973)
10-20 hours per week	1.57 (0.854 - 2.898)
More than 20 hours per week	1.17 (0.890 - 1.528)
Typology of work histories (Ref. group: Type 1 Long-term agricultural work)	
Type 2 Long-term multiple work	0.82 (0.546 - 1.240)
Type 3 Agricultural work & multiple work	0.52** (0.347 - 0.785)
Type 4 Multiple work in middle years	1.12 (0.678 - 1.836)
Type 5 Long-term employment	0.58* (0.375 - 0.898)
Type 6 Ordinary employment & Agricultural work	0.75 (0.426 - 1.318)
Type 7 Long-term self-employment	0.37*** (0.208 - 0.664)
Type 8 Agricultural work & inactivity	0.45** (0.276 - 0.737)
Type 9 Limited economic activities	0.64 (0.369 - 1.095)
Observations	2,593

VARIABLES	A3.4 Rural women
Age group (Ref. group: 60-64)	
65-69	0.84 (0.666 - 1.056)
70-74	0.45*** (0.344 - 0.579)
75 and over	0.20*** (0.151 - 0.267)
Have any IADL difficulties	0.39*** (0.321 - 0.469)
Have any chronic illnesses	0.78* (0.632 - 0.959)
Educational attainment (Ref. group: No formal education)	
Did not finish primary school	0.87 (0.690 - 1.092)
Finish primary school	0.86 (0.665 - 1.123)
Finish middle school	0.68 (0.425 - 1.073)
High school and above	0.62 (0.193 - 2.009)
Household expenditure per capita (Ref. group: the lowest 20%)	
60%-80%	0.88 (0.672 - 1.141)
40%-60%	0.77 (0.588 - 1.013)
20%-40%	1.10 (0.839 - 1.451)
Top 20%	0.89 (0.676 - 1.180)
Receipt of the Occupational pensions	1.04 (0.447 - 2.435)
Region (Ref. group: Eastern)	
Central	1.33* (1.065 - 1.655)
Western	1.68*** (1.352 - 2.081)
Marital status (Ref. group: Married, spouses working)	
Married, spouse not working	0.28*** (0.223 - 0.351)
Separated	0.36 (0.109 - 1.210)
Widowed	0.36*** (0.285 - 0.448)
Intergenerational transfers (Ref. group: No transfers or both directions)	
Net recipient	0.72*** (0.603 - 0.871)
Net provider	0.63 (0.360 - 1.091)
Care provision to grandchildren (Ref. group: No care provision)	
Less than 10 hours per week	1.23 (0.863 - 1.738)
10-20 hours per week	1.00 (0.635 - 1.574)
More than 20 hours per week	0.80* (0.644 - 0.998)
Typology of work histories (Ref. group: Type 1 Long-term agricultural work)	
Type 2 Agricultural work with later inactivity	0.19*** (0.137 - 0.273)
Type 3 Inactivity & agricultural work	0.63 (0.332 - 1.211)
Type 4 Long-term multiple work	0.76 (0.446 - 1.295)
Type 5 Limited economic activities	0.45*** (0.332 - 0.599)
Type 6 Long-term self-employment	0.29** (0.123 - 0.674)
Type 7 Long-term employment	0.62 (0.285 - 1.334)
Observations	2,898

Note: The star symbols indicate the p-values for ORs, where *** represents p<0.001, ** represents p<0.01, * represents p<0.05.

Source: Author's own analysis using data from the CHARLS Wave 2 (2013) and the Life History Wave.

Table A.13 Full Results of Model B2

VARIABLES	B2.1 Urban men	B2.2 Urban women	B2.3 Rural men	B2.4 Rural women
Age group (Reference group: 45-49)				
50-54	1.03 (0.427 - 2.496)	0.62 (0.268 - 1.455)	1.66* (1.080 - 2.546)	1.11 (0.837 - 1.465)
55-59	2.32* (1.036 - 5.214)	0.64 (0.237 - 1.711)	1.73* (1.134 - 2.650)	1.04 (0.774 - 1.390)
60-64	3.26* (1.202 - 8.854)	1.21 (0.349 - 4.201)	2.14** (1.335 - 3.417)	1.25 (0.897 - 1.752)
65-69	2.29 (0.768 - 6.835)	3.03 (0.702 - 13.078)	3.24*** (1.979 - 5.302)	1.65** (1.136 - 2.397)
70+	3.09 (0.877 - 10.911)	10.84* (1.197 - 147.285)	7.22*** (4.353 - 11.980)	3.34*** (2.206 - 5.056)
Have any IADL difficulties in 2011	1.22 (0.263 - 5.622)	1.30 (0.287 - 5.878)	3.37*** (2.265 - 5.017)	2.28*** (1.750 - 2.977)
Changes in IADL difficulties (Ref. group: No change)				
Deteriorate	2.48* (1.091 - 5.654)	1.07 (0.343 - 3.337)	2.71*** (2.063 - 3.563)	1.81*** (1.464 - 2.239)
Improve	0.30 (0.043 - 2.012)	0.29 (0.037 - 2.285)	0.35*** (0.213 - 0.576)	0.57*** (0.413 - 0.793)
Have any chronic illnesses in 2011	1.37 (0.773 - 2.431)	1.11 (0.562 - 2.182)	1.30* (1.005 - 1.688)	1.29* (1.040 - 1.605)
Begin to have chronic illnesses	1.20 (0.485 - 2.966)	1.71 (0.647 - 4.532)	1.31 (0.919 - 1.878)	1.22 (0.894 - 1.657)
Educational attainment (Ref. group: No formal education)				
Did not finish primary school	1.15 (0.314 - 4.239)	0.70 (0.217 - 2.236)	1.12 (0.804 - 1.551)	0.91 (0.730 - 1.128)
Finish primary school	1.09 (0.315 - 3.744)	0.39 (0.127 - 1.211)	1.34 (0.975 - 1.832)	0.99 (0.782 - 1.245)
Finish middle school	1.27 (0.397 - 4.044)	0.49 (0.174 - 1.394)	1.43* (1.009 - 2.019)	1.08 (0.811 - 1.434)
High school or above	0.96 (0.304 - 3.062)	0.44 (0.146 - 1.306)	1.44 (0.908 - 2.295)	0.99 (0.597 - 1.652)
No house ownership	1.98 (0.939 - 4.162)	0.58 (0.246 - 1.376)	1.04 (0.779 - 1.400)	0.95 (0.739 - 1.220)
Quintile of household expenditure per capita (Ref. group: Lowest 20%)				
60%-80%	0.99 (0.524 - 1.886)	0.65 (0.278 - 1.504)	1.12 (0.822 - 1.524)	0.96 (0.757 - 1.219)
40%-60%	1.63 (0.844 - 3.146)	0.80 (0.352 - 1.833)	1.14 (0.833 - 1.565)	0.82 (0.643 - 1.057)
20%-40%	1.39 (0.677 - 2.853)	1.11 (0.470 - 2.631)	1.50 (1.103 - 2.039)	0.83 (0.642 - 1.062)
Top 20%	1.08 (0.486 - 2.414)	1.02 (0.394 - 2.632)	1.26 (0.903 - 1.755)	0.93 (0.715 - 1.200)
Receipt of the Occupational Pensions in 2011	2.21* (1.098 - 4.455)	2.36* (1.026 - 5.433)	1.67 (0.949 - 2.924)	2.26 (0.885 - 5.766)
Begin to receive the Occupational Pensions	3.43*** (1.749 - 6.744)	1.95 (0.920 - 4.134)	1.91* (1.134 - 3.234)	1.27 (0.677 - 2.377)
Receipt of Residents' Social Pensions in 2011	1.34 (0.507 - 3.563)	1.49 (0.437 - 5.085)	1.06 (0.761 - 1.479)	1.07 (0.806 - 1.425)
Begin to receive Residents' Social Pensions	0.26* (0.083 - 0.827)	0.52 (0.204 - 1.331)	1.04 (0.794 - 1.351)	1.06 (0.849 - 1.322)

(continued on the next page)

VARIABLES	B21 Urban men	B22 Urban women	B23 Rural men	B24 Rural women
Marital status in 2011 (Ref. group: Married, spouses working)				
Married, spouses not working	5.67*** (3.053 - 10.520)	3.08* (1.180 - 8.032)	3.30*** (2.493 - 4.359)	2.17*** (1.608 - 2.939)
Widowed	6.10* (1.489 - 24.975)	0.40 (0.124 - 1.290)	4.34*** (2.999 - 6.283)	2.37*** (1.816 - 3.097)
Changes in marital status (Ref. group: No change)				
Spouses left work	5.11*** (2.672 - 9.772)	4.07** (1.636 - 10.133)	3.74*** (2.906 - 4.811)	3.51*** (2.758 - 4.468)
Spouses began to work	0.58 (0.257 - 1.298)	0.29 (0.074 - 1.119)	0.29*** (0.172 - 0.499)	0.34** (0.178 - 0.649)
Become widowed	1.93 (0.264 - 14.109)	1.49 (0.258 - 8.644)	1.72 (0.988 - 2.998)	1.61** (1.140 - 2.279)
Spouses receiving Occu. Pensions in 2011	0.98 (0.548 - 1.760)	0.54 (0.227 - 1.279)	2.31 (0.948 - 5.632)	1.30 (0.914 - 1.847)
Intergenerational transfer (Ref. No transfer or both directions)				
Net recipient	0.68 (0.336 - 1.394)	0.70 (0.257 - 1.900)	1.15 (0.913 - 1.447)	1.04 (0.853 - 1.269)
Net provider	0.97 (0.553 - 1.702)	0.35** (0.184 - 0.668)	0.97 (0.706 - 1.338)	1.06 (0.830 - 1.343)
Care provision to grandchildren in 2011 (Ref. group: No care provision)				
Care provision to grandchildren: 0-10H/W	1.71 (0.643 - 4.533)	2.08 (0.613 - 7.048)	1.27 (0.863 - 1.882)	1.17 (0.842 - 1.613)
Care provision to grandchildren: 10-20H/W	0.49 (0.078 - 3.143)	0.99 (0.047 - 20.850)	1.06 (0.598 - 1.885)	1.29 (0.838 - 1.991)
Care provision to grandchildren: 20+H/W	1.31 (0.670 - 2.548)	1.20 (0.461 - 3.114)	0.99 (0.738 - 1.335)	1.19 (0.938 - 1.505)
Changes in care provision to grandchildren (Ref. group: No change)				
Stop care provision to grandchildren	0.37* (0.154 - 0.880)	0.79 (0.217 - 2.879)	1.28 (0.925 - 1.772)	0.87 (0.647 - 1.157)
Start care provision to grandchildren	0.94 (0.522 - 1.708)	2.18* (1.071 - 4.448)	1.01 (0.759 - 1.351)	1.55*** (1.257 - 1.909)
Any alive parents in 2011	1.27 (0.601 - 2.698)	1.87 (0.674 - 5.166)	0.94 (0.677 - 1.310)	0.89 (0.669 - 1.186)
Any alive parents in 2015	0.43* (0.196 - 0.920)	0.92 (0.338 - 2.491)	0.91 (0.640 - 1.299)	1.26 (0.944 - 1.686)
Pseudo R-square	0.281	0.152	0.189	0.103
Observations	595	306	3,968	3,940

Note: The star symbols indicate the p-values for ORs, where *** represents p<0.001, ** represents p<0.01, * represents p<0.05.

Source: Author's own analysis using data from the CHARLS Wave 1 (2011), Wave 3 (2015) and the Life History Wave.

Table A.14 Full results of Model B3, by subgroup

VARIABLES	B3.1 Urban men
Age group (Ref. group: 60-64)	
65-69	1.12 (0.494 - 2.532)
70-74	1.71 (0.595 - 4.916)
75 and over	0.71 (0.196 - 2.541)
Have any IADL difficulties in 2011	0.99 (0.152 - 6.477)
Changes in ADL difficulties (Ref. group: No change)	
Deteriorated health status	1.96 (0.655 - 5.870)
Improved health status	0.48 (0.053 - 4.443)
Receive the occupational pensions in 2011	3.81 (0.785 - 18.444)
Begin to receive the occupational pensions	4.40 (0.900 - 21.533)
Receive the Residents' Social pensions in 2011	1.44 (0.525 - 3.922)
Begin to receive the Residents' Social pensions	0.28 (0.077 - 1.024)
Marital status in 2011 (Ref. group: marries, spouses working)	
Married, spouses not working	8.66*** (3.748 - 20.000)
Widowed	4.21 (0.519 - 34.088)
Changes in marital status (Ref. group: No change)	
Spouses left work	6.27*** (2.689 - 14.630)
Spouses began to work	0.40 (0.106 - 1.501)
Become widowed	0.50 (0.018 - 13.714)
Care provision to grandchildren in 2011 (Ref. group: No care provision)	
Less than 10 hours per week	2.68 (0.625 - 11.493)
10-20 hours per week	0.72 (0.093 - 5.604)
More than 20 hours per week	1.21 (0.494 - 2.962)
Changes in care provision to grandchildren (Ref. group: No change)	
Stop care provision to grandchildren	0.37 (0.122 - 1.143)
Start care provision to grandchildren	1.11 (0.458 - 2.680)
Care provision to parents in 2011 (Any surviving parents in 2011) Stop care provision to parents (No surviving parents in 2015)	0.48 (0.147 - 1.599) 2.09 (0.726 - 6.022)
Typology of work histories (Ref. group: Type 7 Long-term ordinary employment)	
Type 1 Limited economic activities	0.67 (0.176 - 2.527)
Type 2 Long-term agricultural work	0.36* (0.118 - 0.976)
Type 3 Long-term multiple work	0.29 (0.056 - 1.453)
Type 4 Long-term self-employment	0.80 (0.201 - 3.179)
Type 5 Long-term Bianzhi employment	0.74 (0.363 - 1.512)
Type 6 Bianzhi employment with Other early experiences	0.82 (0.309 - 2.169)
Type 8 Ordinary employment with other early experiences	1.00 (0.299 - 3.341)
Type 9 Mid-life career transformation	0.73 (0.267 - 1.981)
Observations	228

VARIABLES	B3.2 Urban women
Age group (Ref. group: 55-69)	
60-64	2.49 (0.640 - 9.656)
65-69	12.65** (1.861 - 86.022)
70-74	24.25 (0.980 - 600.245)
75 and over	30.19* (1.188 - 767.094)
Have any IADL difficulties in 2011	0.98 (0.063 - 15.297)
Changes in ADL difficulties (Ref. group: No change)	
Deteriorated health status	4.18 (0.679 - 25.703)
Improved health status	0.54 (0.032 - 9.250)
Receive the occupational pensions in 2011	2.68 (0.613 - 11.727)
Begin to receive the occupational pensions	32.79*** (4.207 - 255.619)
Receive the Residents' Social pensions in 2011	1.73 (0.312 - 9.535)
Begin to receive the Residents' Social pensions	0.64 (0.164 - 2.529)
Marital status in 2011 (Ref. group: marries, spouses working)	
Married, spouses not working	4.75* (1.160 - 19.484)
Widowed	1.00 (0.181 - 5.522)
Changes in marital status (Ref. group: No change)	
Spouses left work	2.31 (0.451 - 11.838)
Spouses began to work	0.17 (0.019 - 1.506)
Become widowed	(omitted)
Intergenerational material transfers (Ref. group: No transfer or both directions)	
Net recipient in 2011	1.42 (0.355 - 5.691)
Net provider in 2011	0.16** (0.040 - 0.629)
Care provision to grandchildren in 2011 (Ref. group: No care provision)	
Less than 10 hours per week	1.88 (0.313 - 11.318)
10-20 hours per week	-
More than 20 hours per week	1.41 (0.318 - 6.291)
Changes in care provision to grandchildren (Ref. group: No change)	
Stop care provision to grandchildren	1.90 (0.320 - 11.337)
Start care provision to grandchildren	1.76 (0.376 - 8.247)
Care provision to parents in 2011 (Any surviving parents in 2011)	1.86 (0.296 - 11.713)
Stop care provision to parents (No surviving parents in 2015)	1.97 (0.318 - 12.240)
Typology of work histories (Ref. group: Type 7 Long-term ordinary employment)	
Type 1 Limited economic activities	0.29 (0.080 - 1.020)
Type 2 Long-term agricultural work	0.31* (0.113 - 0.825)
Type 3 Agricultural work & ordinary employment	0.70 (0.197 - 2.485)
Type 4 Long-term self-employment	0.80 (0.205 - 3.125)
Type 5 Long-term Bianzhi employment	1.07 (0.199 - 5.714)
Type 6 Bianzhi employment with other early experiences	0.27 (0.025 - 2.902)
Type 8 Ordinary employment with other early experiences	0.80 (0.205 - 3.125)
Type 9 Mid-life career transformation	0.16 (0.016 - 1.560)
Observations	149

VARIABLES	B3.3 Rural men
Age group (Ref. group: 60-64)	
65-69	1.44* (1.046 - 1.985)
70-74	2.41*** (1.708 - 3.403)
75 and over	4.43*** (3.008 - 6.530)
Have any IADL difficulties in 2011	2.03** (1.251 - 3.299)
Changes in ADL difficulties (Ref. group: No change)	
Deteriorated health status	2.44*** (1.766 - 3.384)
Improved health status	0.81 (0.503 - 1.296)
Receive the occupational pensions in 2011	1.52 (0.815 - 2.852)
Begin to receive the occupational pensions	2.04* (1.143 - 3.660)
Marital status in 2011 (Ref. group: marries, spouses working)	
Married, spouses not working	3.24*** (2.281 - 4.599)
Widowed	5.01*** (3.294 - 7.615)
Changes in marital status (Ref. group: No change)	
Spouses left work	3.63*** (2.627 - 5.028)
Spouses began to work	0.42** (0.225 - 0.770)
Become widowed	1.77 (0.978 - 3.192)
Region (Ref. group: Eastern)	
Central	1.27* (1.010 – 1.572)
East	1.02 (0.799 – 1.213)
Typology of work histories (Ref. group: Type 1 Long-term agricultural work)	
Type 2 Long-term multiple work	0.96 (0.589 - 1.572)
Type 3 Agricultural work & multiple work	2.14** (1.298 - 3.543)
Type 4 Multiple work in middle years	0.88 (0.470 - 1.638)
Type 5 Long-term employment	1.50 (0.854 - 2.639)
Type 6 Ordinary employment & Agricultural work	1.89 (0.999 - 3.570)
Type 7 Long-term self-employment	1.66 (0.744 - 3.685)
Type 8 Agricultural work & inactivity	0.58 (0.255 - 1.341)
Type 9 Limited economic activities	0.63 (0.293 - 1.368)
Observations	1,778

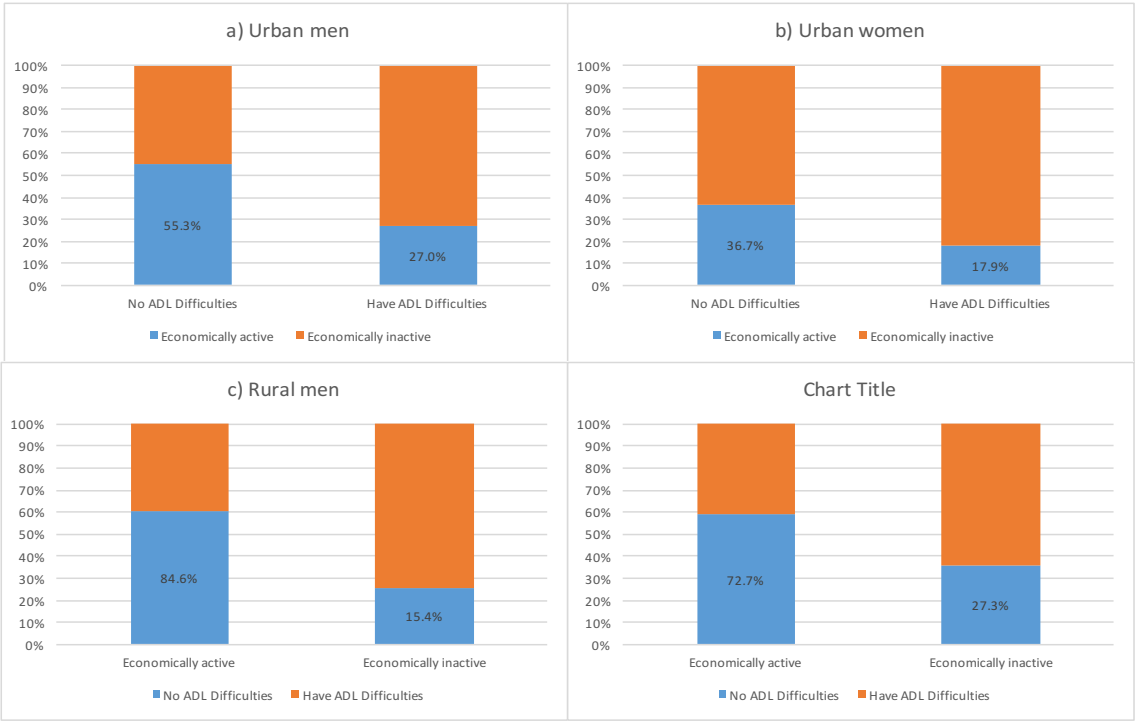
VARIABLES	B3.4 Rural women
Age group (Ref. group: 60-64)	
65-69	1.23 (0.933 - 1.635)
70-74	1.90*** (1.335 - 2.703)
75 and over	4.10*** (2.619 - 6.421)
Have any IADL difficulties in 2011	1.78** (1.230 - 2.563)
Changes in ADL difficulties (Ref. group: No change)	
Deteriorated health status	1.56** (1.163 - 2.094)
Improved health status	0.81 (0.555 - 1.173)
Marital status in 2011 (Ref. group: marries, spouses working)	
Married, spouses not working	2.61*** (1.796 - 3.785)
Widowed	2.22*** (1.584 - 3.110)
Changes in marital status (Ref. group: No change)	
Spouses left work	3.79*** (2.703 - 5.304)
Spouses began to work	0.25** (0.096 - 0.636)
Become widowed	1.87** (1.200 - 2.914)
Care provision to grandchildren in 2011 (Ref. group: No care provision)	
Less than 10 hours per week	1.04 (0.647 - 1.680)
10-20 hours per week	1.18 (0.631 - 2.205)
More than 20 hours per week	1.14 (0.807 - 1.623)
Changes in care provision to grandchildren (Ref. group: No change)	
Stop care provision to grandchildren	1.00 (0.668 - 1.493)
Start care provision to grandchildren	1.35 (0.979 - 1.862)
Region (Ref. group: Eastern)	
Central	0.66** (0.493 - 0.892)
Western	0.70* (0.531 - 0.932)
Typology of work histories (Ref. group: Type 1 Long-term agricultural work)	
Type 2 Agricultural work with later inactivity	2.29** (1.267 - 4.130)
Type 3 Inactivity & agricultural work	1.23 (0.481 - 3.146)
Type 4 Long-term multiple work	0.89 (0.402 - 1.955)
Type 5 Limited economic activities	1.72* (1.120 - 2.650)
Type 6 Long-term self-employment	1.19 (0.311 - 4.570)
Type 7 Long-term employment	0.32 (0.069 - 1.538)
Observations	1,617

Note: The star symbols indicate the p-values for ORs, where *** represents p<0.001, ** represents p<0.01, * represents p<0.05.

Source: Author's own analysis using data from the CHARLS Wave 1 (2011), Wave 3 (2015) and the Life History Wave.

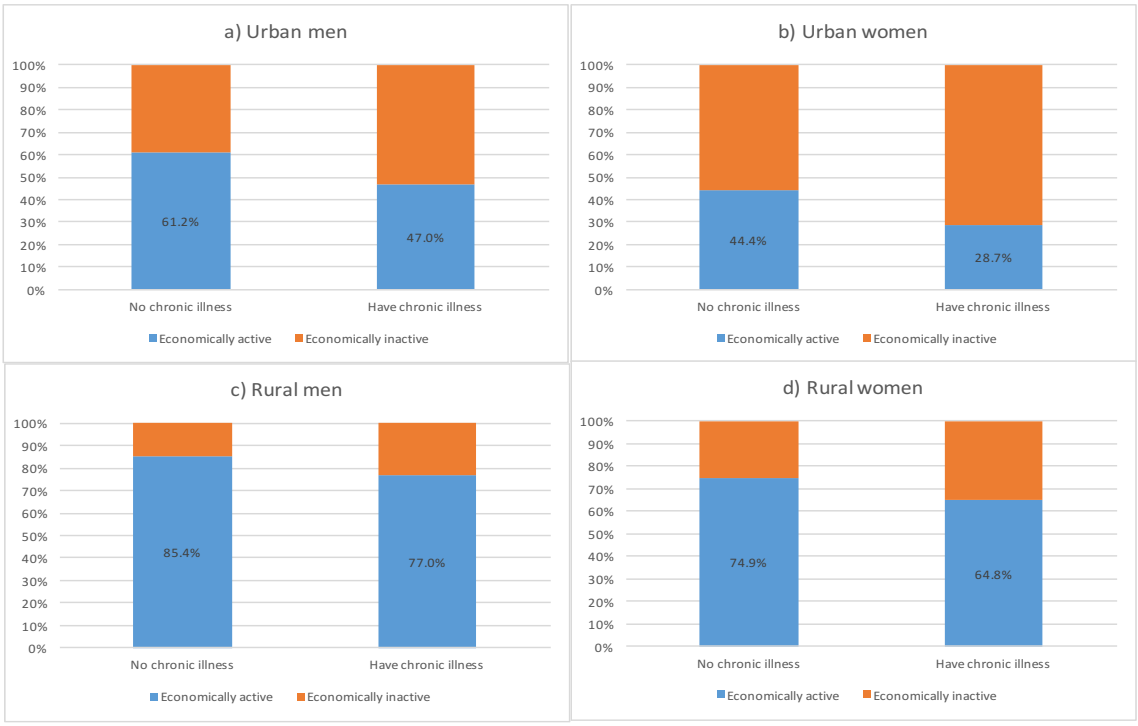
Appendices B Figures

Figure B.1 Labour force participation in 2013 by ADL difficulties (Sample A)



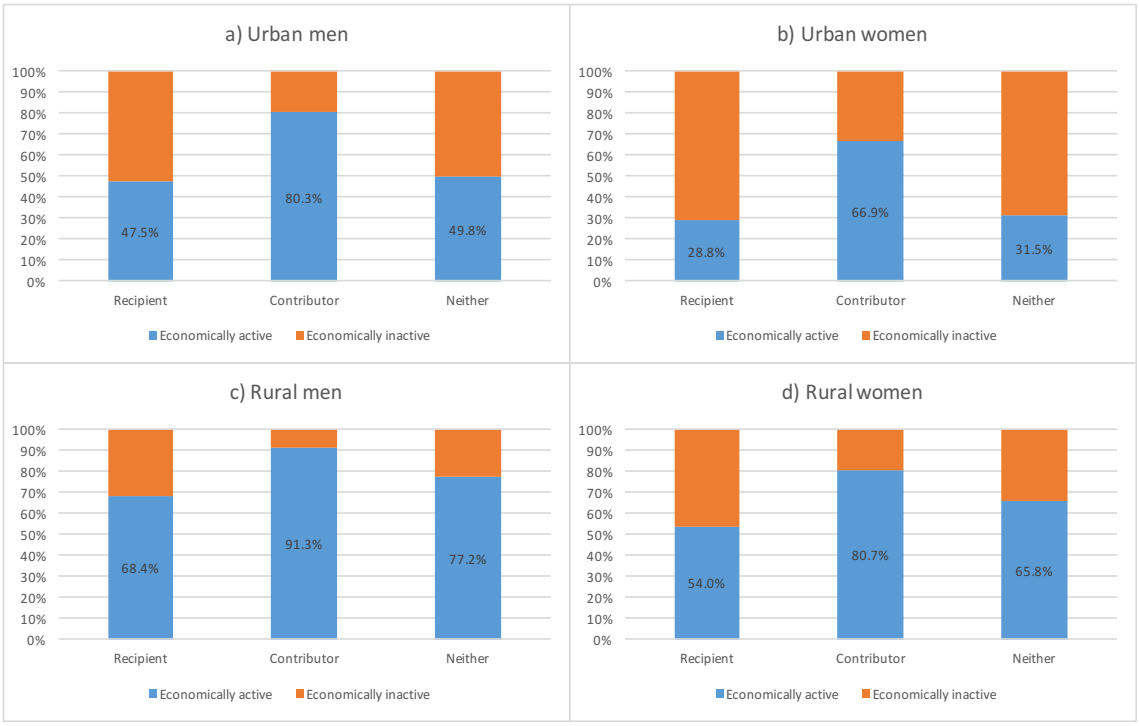
Note: Chi-square tests are significant for all the four subgroups at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Figure B.2 Labour force participation in 2013 by chronic illnesses (Sample A)



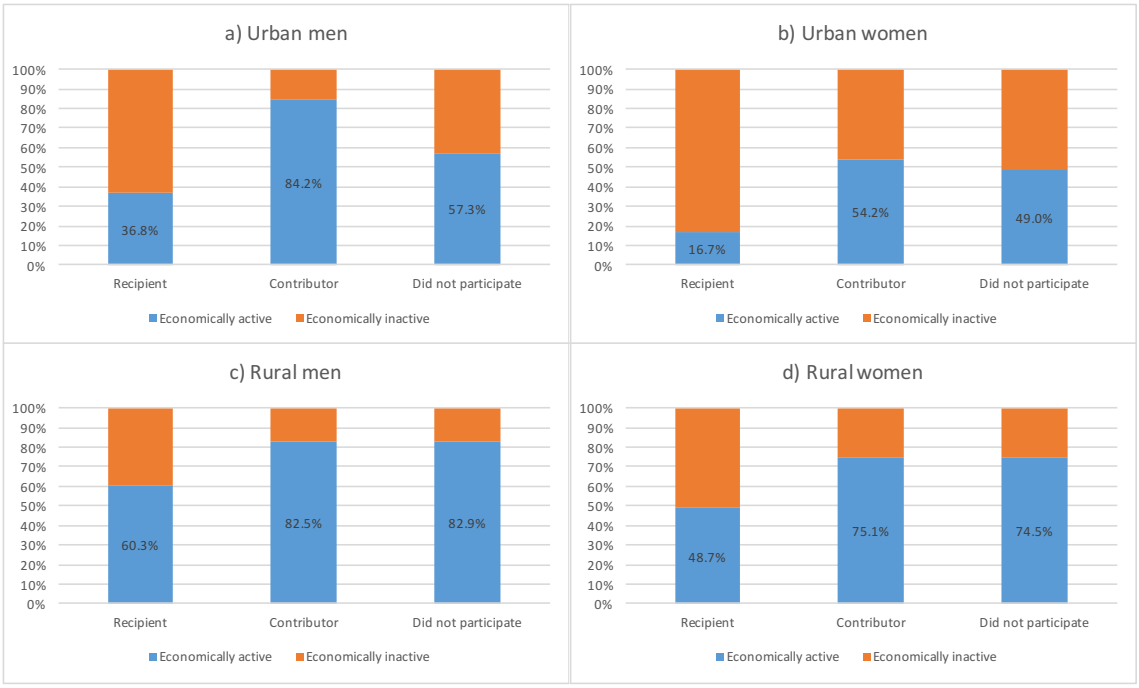
Note: Chi-square tests are significant for all the four subgroups at the 95% confidence level.
Source: Author's own analysis using data from CHARLS Wave 2 (2013).

Figure B.3 Labour force participation in 2013 by entitlements of the Residents' Social Pension Programme (Sample A)



Note: Chi-square tests are significant for all the four subgroups at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Figure B.4 Labour force participation in 2013 by spouses' pension status (the Occupational Pension Programme, Sample A)



Note: Chi-square tests are significant for all the four subgroups at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

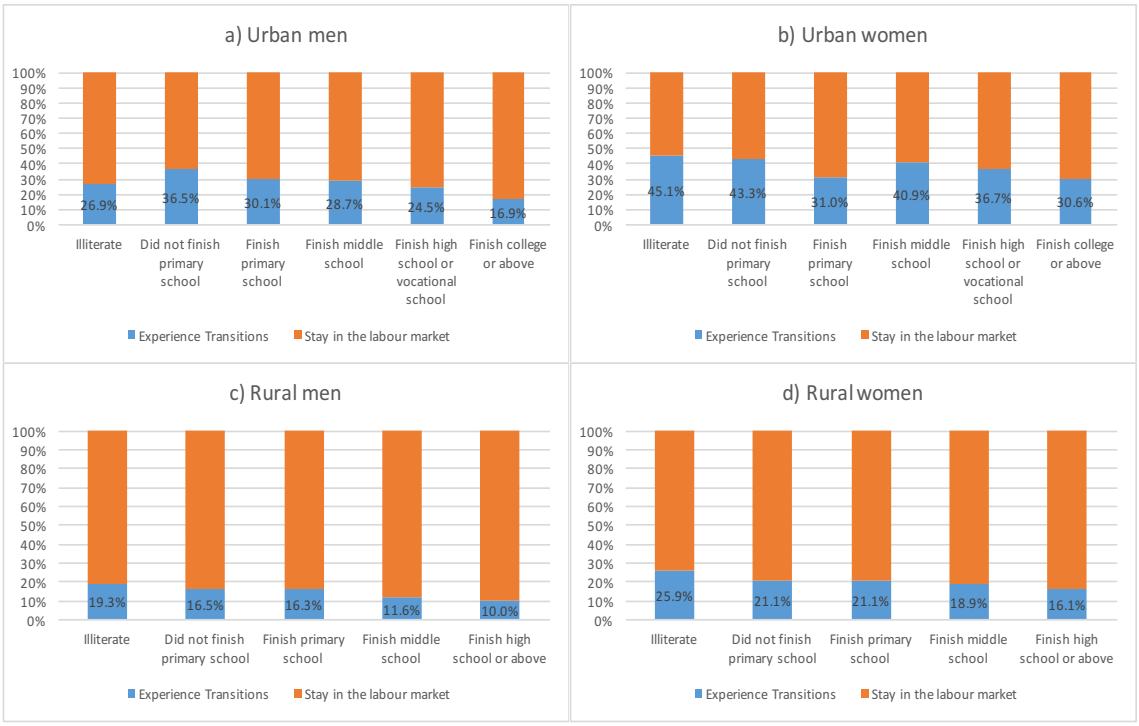
Figure B.5 Labour force participation in 2013 by care provision to parents (Sample A)

Note: Chi-square tests are significant for all the four subgroups at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 2 (2013).

Figure B.6 Transition into economically inactive status by the prevalence of chronic illnesses over the period from 2011 to 2015 (Sample B)

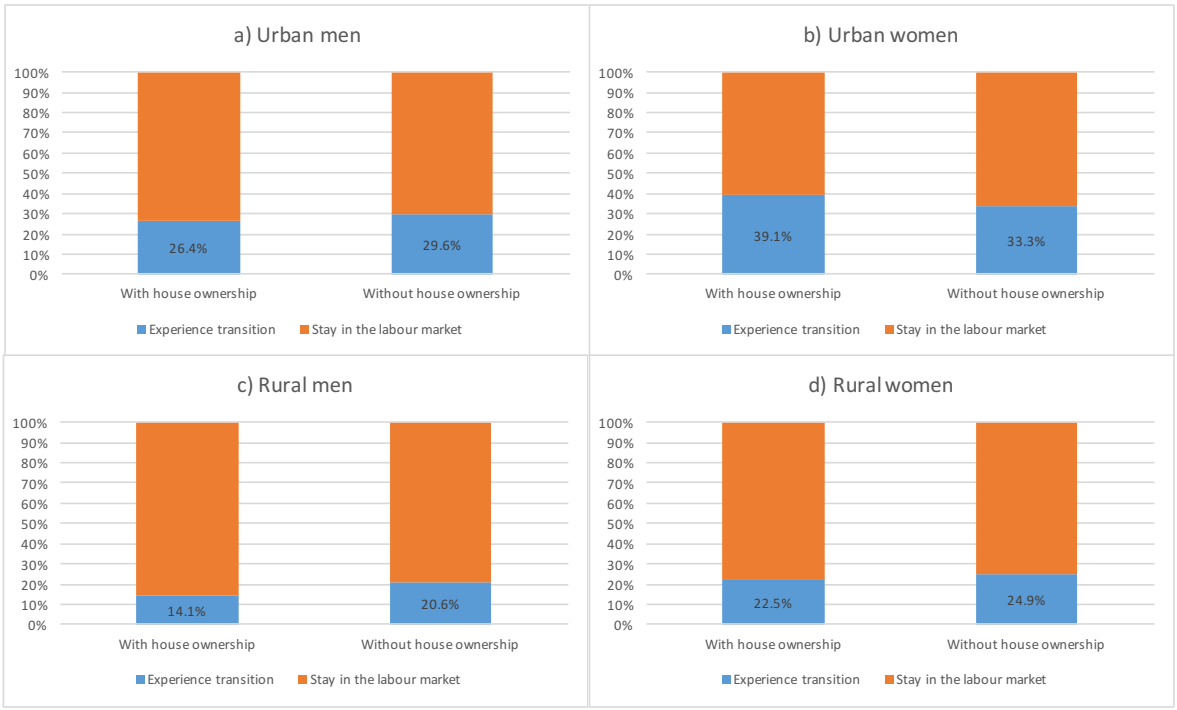
Note: Chi-square tests are significant for rural residents at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Figure B.7 Transition into economically inactive status by educational attainment (Sample B)



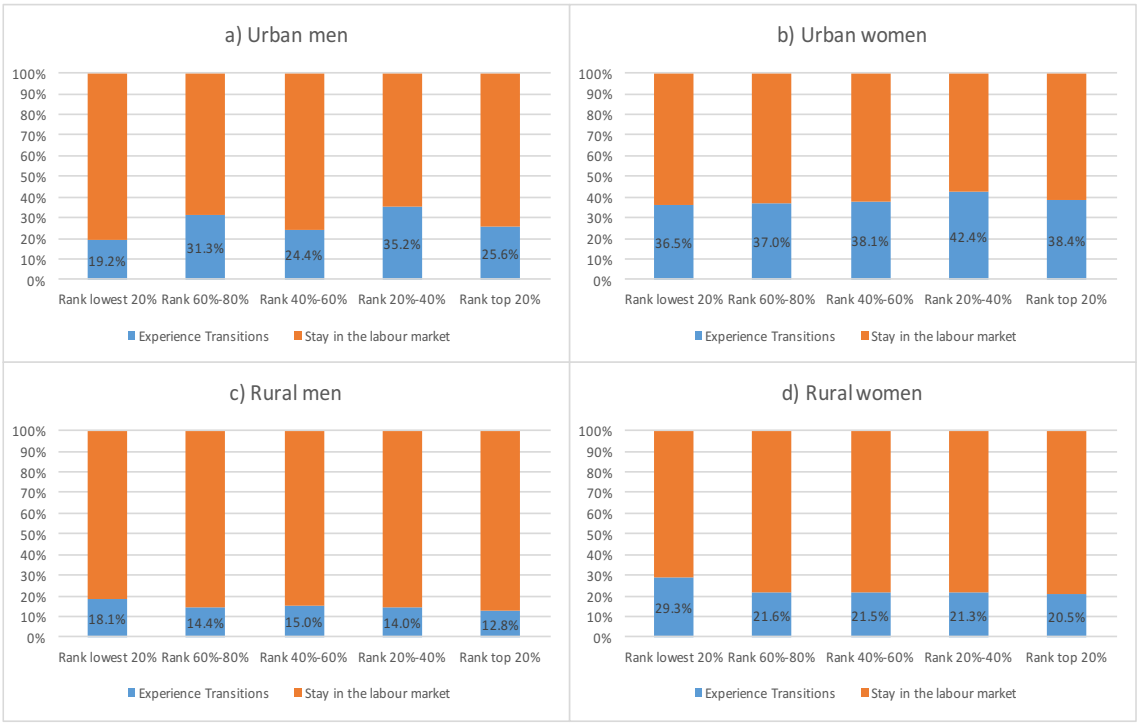
Note: The Chi-square tests are significant for rural residents at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Figure B.8 Transition into economically inactive status by house ownership in 2011 (Sample B)



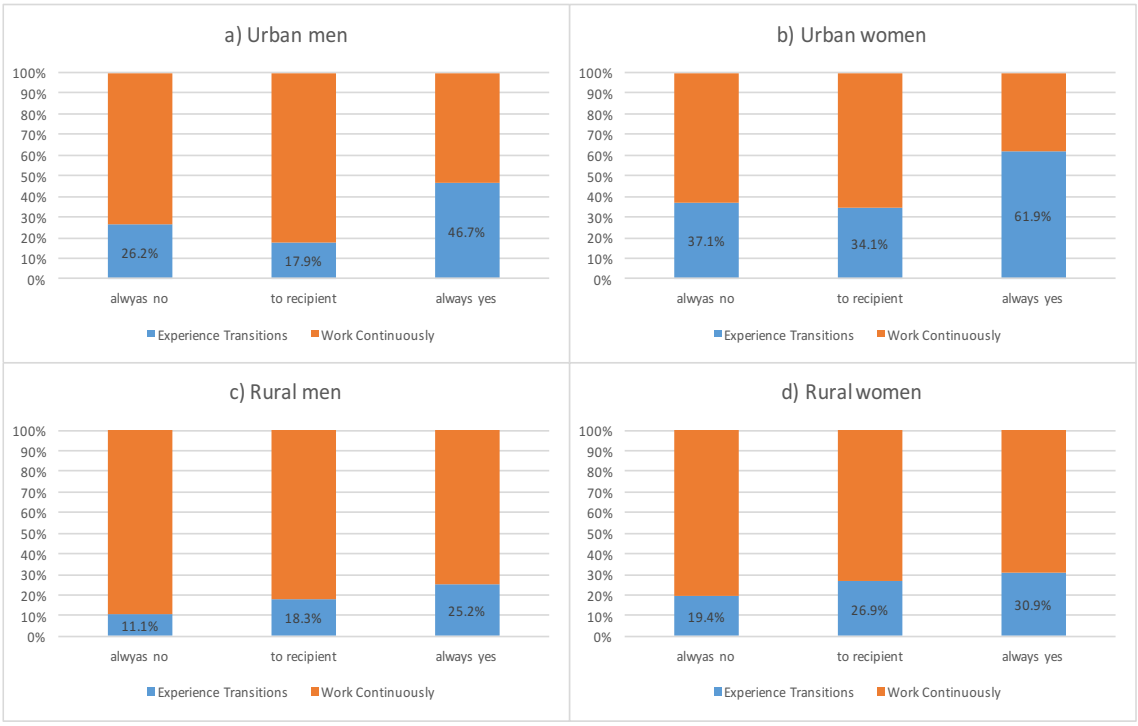
Note: The Chi-square tests are significant for rural residents at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Figure B.9 Transition into economically inactive status by household expenditure in 2011 (Sample B)



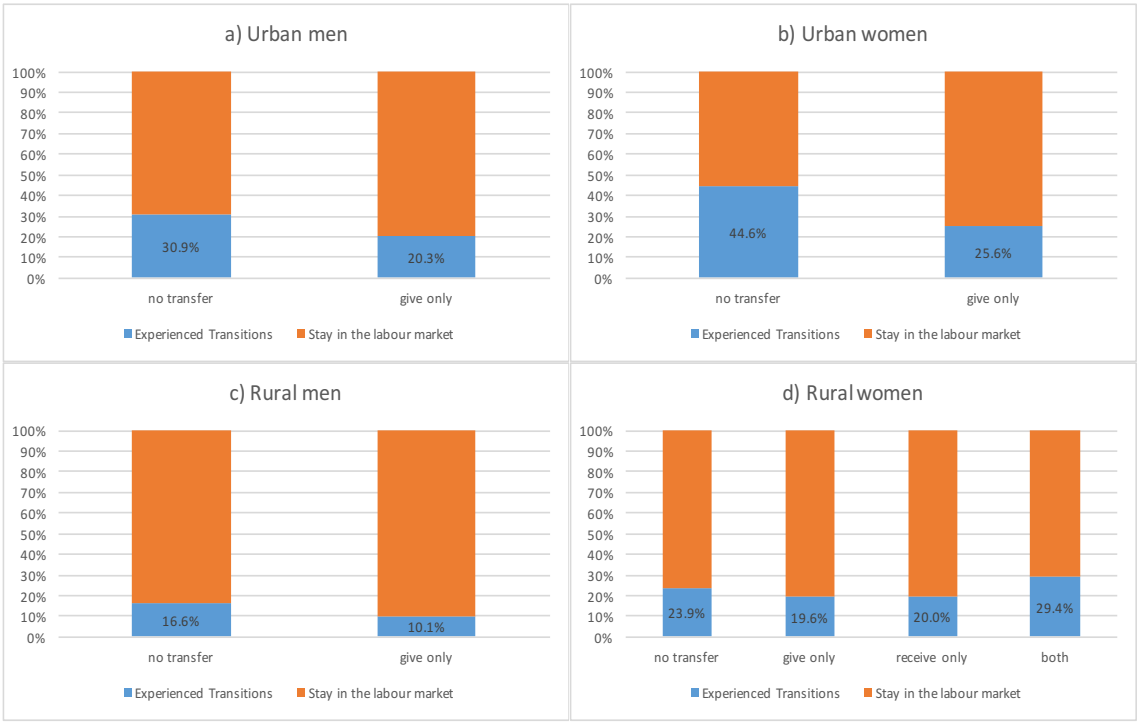
Note: Chi-square tests are significant for rural residents at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Figure B.10 Transition into economically inactive status by the access to the Residents' Social Pension Programme (Sample B)



Note: Chi-square tests are significant for rural residents at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

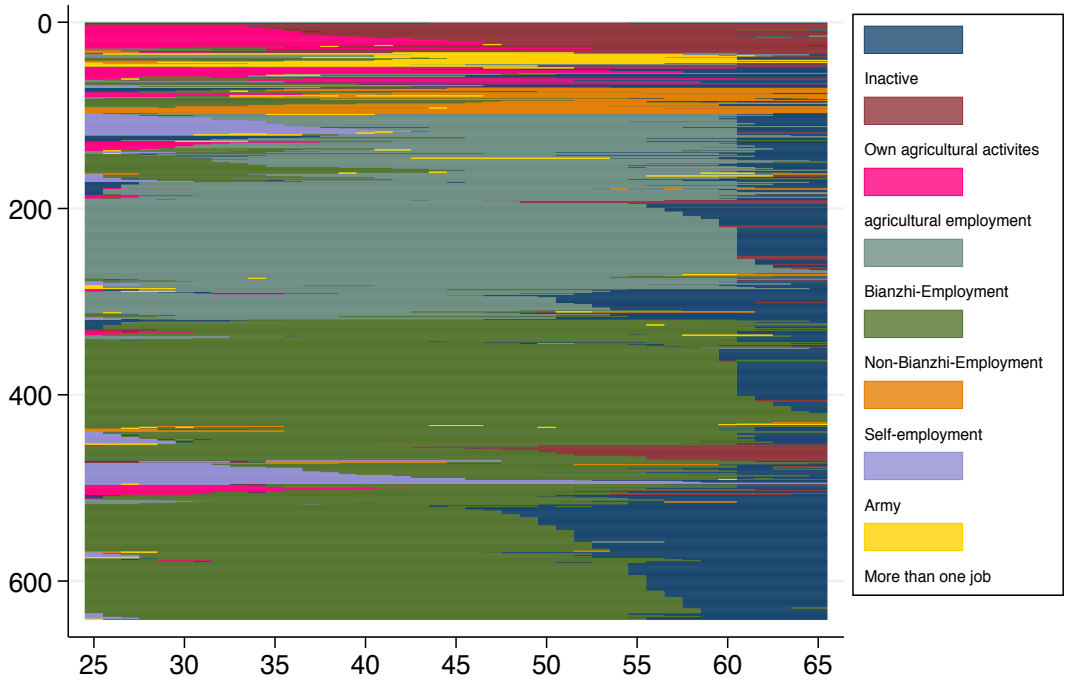
Figure B.11 Transition into economically inactive status by material transfer with parents in 2011 (Sample B)



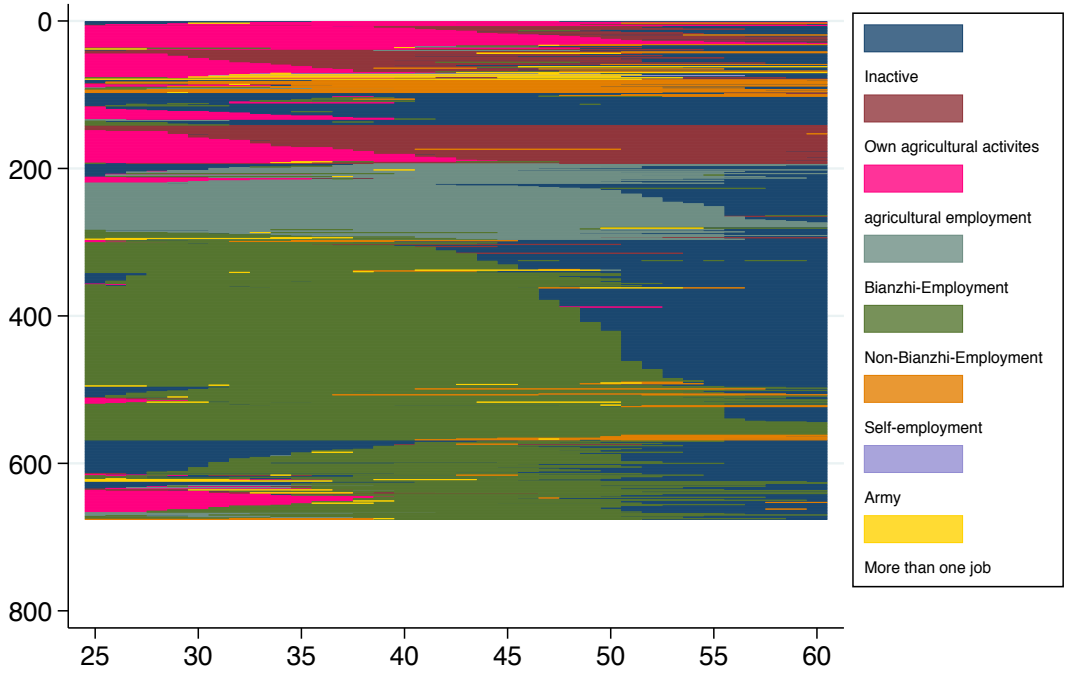
Note: 1) The category of receive only and both directions are not included due to the small sample size.
2) The Chi-square tests are significant for all subgroups at the 95% confidence level.
Source: Author's own analysis using data from the CHARLS Wave 1 (2011) & Wave 3 (2015).

Figure B.12 Trajectories of economic activity status, ages 25 to 65 (60 for urban women)

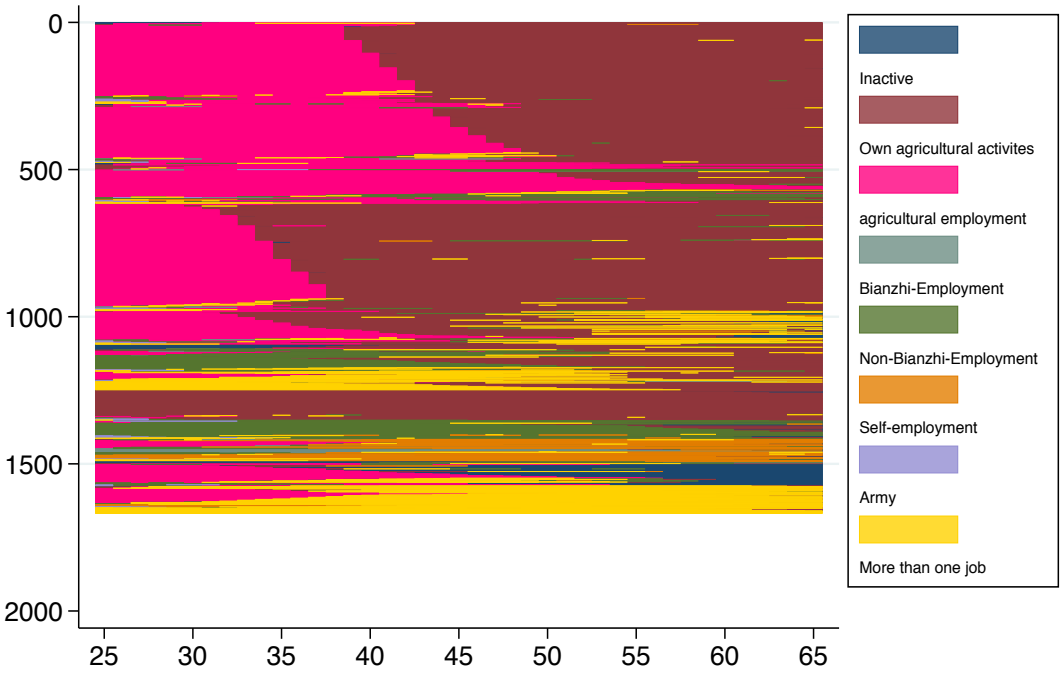
a) Urban men (N=641)



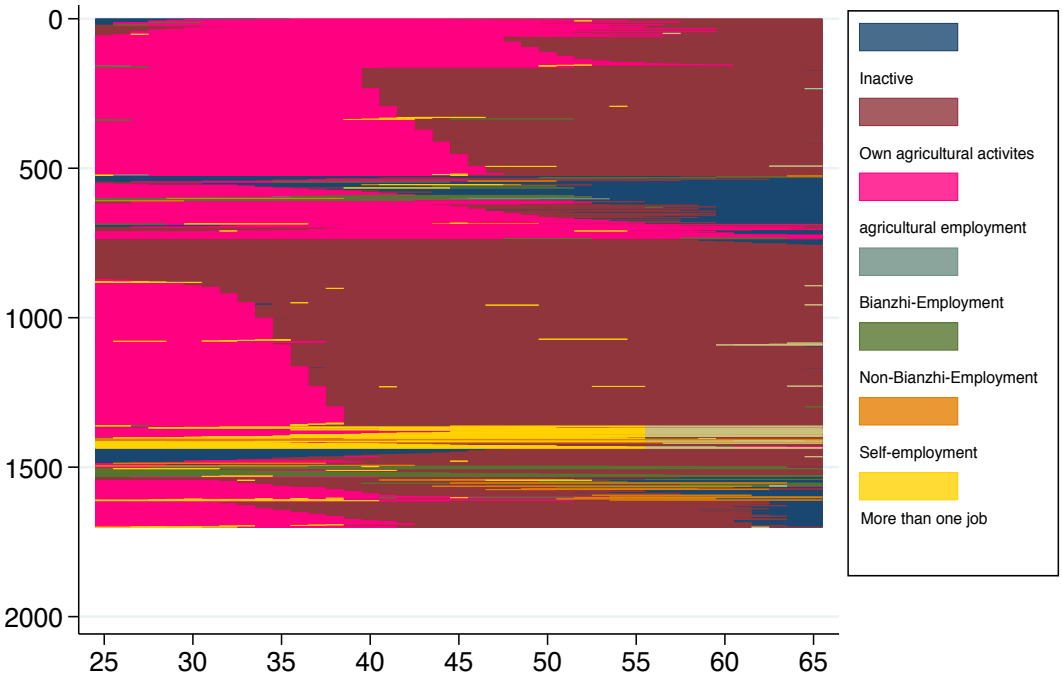
b) urban women (N=695)



c) Rural men (N=2,764)



d) Rural women (N=2,912)



Source: Author's own analysis using CHARLS Life History Wave (2014).

Figure B.13 Approval email from the Ethical and Research Governance Online

Thursday, 6 June 2019 at 10:03:58 British Summer Time

Subject: Your Ethics Submission (Ethics ID:20954) has been reviewed and approved
Date: Thursday, 4 August 2016 at 10:18:09 British Summer Time
From: ERGO
To: Xu M.
Category: 蓝色类别

Submission Number: 20954
Submission Name: The labour market exit behaviours of the older Chinese individuals and the determinants-Evidence from CHARLS(SDA)
This is email is to let you know your submission was approved by the Ethics Committee.

Comments
None
Click here to view your submission
Coordinator: Maodi Xu

ERGO : Ethics and Research Governance Online
http://www.ergo.soton.ac.uk

DO NOT REPLY TO THIS EMAIL

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