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**RETIRING IN CONTEXT: HOW
SOCIO-ECONOMIC RESOURCES AND PENSION
ELIGIBILITY PRODUCE UNEQUAL LATE
CAREERS**

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Retiring in Context: How Socio-Economic Resources and Pension Eligibility
Produce Unequal Late Careers

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A thesis submitted in partial fulfilment of the requirements for the degree of
Doctor of Philosophy

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Dedication

This thesis is dedicated to the “baby boomer generation” in China, who grew up in historical and socio-economic upheavals and are now approaching retirement under growing uncertainties. It compliments their productive engagement in society while speaking out about the emerging retirement dilemma that has increasingly trapped many of our family members, relatives, and friends during their transition into old adulthood. It is also prepared for researchers, practitioners, and policymakers who endeavour to respond proactively to economic and healthcare challenges by creating an equal and vibrant ageing workforce, especially in middle- and low-income regions across the globe.

Abstract

With unprecedented demographic upheavals, the number and proportion of older people in the labour market are growing worldwide. The extension of working lives creates not only possibilities but also uncertainties for older workers. To support older workers of diverse backgrounds and enhance retirement security, researchers must advance the understanding of why older people choose to retire or work longer and how late-career engagement affects their life chances.

Much literature has explored the retirement process and how proximate work, family, health, and motivational factors shape the opportunity structure of retirement. Nonetheless, how late-career decisions are made in the temporal and spatial contexts over the life course remains unclear. In particular, a comprehensive analysis of how socio-economic resources and social policies shape inequalities in late careers in ageing China is lacking. The present research aims to profile late working careers, investigate how socio-economic resources at various life stages and levels influence retirement and employment behaviours, and examine the health impacts of late-career engagement on older Chinese adults. Drawing upon the life course perspective, it proposes a framework that integrates temporal and spatial processes of late careers while considering the interplay between socio-economic resources and the pension system.

Using prospective and retrospective survey data from the China Health and Retirement Longitudinal Study (2011–2020), four studies were conducted to unpack the complexity of late careers in context. First, the study on lifetime socio-economic dynamics reveals that adulthood socio-economic resources and advantaged social mobility trajectories, including upward mobility and stably high status, were associated with lower odds

of late-life employment, especially after pension eligibility ages. However, older adults from advantaged family backgrounds may be more likely to work in later adulthood. The extended working lives in disadvantaged older groups, with fewer adulthood socioeconomic resources or from unfavourable social mobility trajectories, signify the prominence of financial necessity concerning increasing pension income gaps, hukou-based access to welfare rights, and family financial needs. Second, socio-economic resources in the neighbourhood have a non-linear relationship with the transition into retirement, with older workers in resource-rich and resource-poor neighbourhoods both at a higher risk of labour market exit. The non-linear effects of neighbourhood socio-economic resources on labour market exit vary by individual occupation and household income, showing that less resourceful older workers are more sensitive to neighbourhood contexts. Third, internal migration, as a rational strategy for people seeking a better life, could benefit economic attainment and reduce the odds of employment beyond pension ages among older migrants. However, rural-origin migrants are more likely to work after reaching pension eligibility ages than urban-origin migrants. Disadvantaged older migrants who have gained fewer economic opportunities and experience welfare exclusion may have to work longer than their counterparts. Fourth, employment is generally beneficial for survival in mid-later adulthood. By considering both employment status and pension eligibility, it shows that inactivity before receiving pension income may trigger a greater risk of all-cause mortality and that employment continuity in retirement could reduce the risk of all-cause mortality. The longevity premium of employment continuity is more pronounced among older workers with more socio-economic resources but insufficient retirement protections.

The findings indicate that differentiation in retirement decisions among older Chinese adults stems chiefly from socio-economic resources and welfare policies. Systematically uncovering the temporal and spatial dynamics that structure individual life chances could contextualise the understanding of unequal late careers. The findings provide important implications for public policymakers and social service providers aiming to support the rapidly expanding ageing workforce and enhance retirement well-being in China and elsewhere.

Publications arising from the thesis

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Chapter 1

Introduction

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Introduction: Making Sense of Late-Career Dynamics in Contexts**1.1 Demographic Transformation**

Never was there a time when people could live longer and healthier than previous generations. Since the second half of the twentieth century, persistently declining mortality and fertility rates have transformed numerous countries and areas into societies with growing proportions of older people. The remarkable increases in life expectancy are not solely taking place in high-income, industrialised countries but rather a shared achievement across the globe. According to the UN (2024), the number of ageing societies—referring to countries or regions where older people aged 65 or above account for at least 7 per cent of the total population—has increased from 89 in 2000 to 139 in 2024. Demographic ageing will affect more regions in the decades ahead at an accelerating scale and pace. By 2085, no countries are expected to remain young after the last “demographic outlier” (Harper, 2014) in Africa, Chad, has advanced to an ageing economy.

Undoubtedly, the rise of ageing societies represents a “societal triumph” (Greer et al., 2022). This historical progress that has taken centuries in industrialised countries but just a few decades in developing societies can be divided into two phases. In the first stage of demographic transition starting in the 18th century in Europe, the gradual decline in mortality rate while maintaining a high fertility rate created long-term growth in prime working-age populations (Lee, 2003, 2011), which drove the development of modern industrial economies. The transition we experience today is featured by low fertility rates dropping below the replacement level, delayed transitions into adulthood, and the increasing old-age support ratio and is called the “second demographic transition” (Lesthaeghe, 2010), or the “longevity transition” (Eggleson & Fuchs, 2012). Especially in East Asian regions, the demographic dividends that supported the economic miracle since the 1980s (Bloom & Williamson, 1998) have evolved into demographic deficits due to the rapidly shrinking workforce and growing older populations. In the middle of this century, East and South-East Asia will overtake Europe to become the world’s oldest

region (UN, 2023). To illustrate the evolving population age structures, Figure 1.1 shows trends in the old-age dependency ratio [OADR]—defined as the number of older people aged 65 or above per 100 working-age people aged between 15 and 64—in China, Europe, and Northern America from 1950 to 2100. Notably, after a rapid two-fold increase from 10.25 in 2000 to 21.15 in 2024, China’s OADR will rise almost monotonically to 52.29 in 2050 and eventually peak at 109.47 in 2086¹.

[Insert Figure 1.1 about here]

Against the backdrop of this historical achievement, there are considerable public concerns over the unprecedented impacts of demographic changes on the economy and society. For example, the ageing and retirement of “baby boomer generations”, referring to people born between 1945 and the 1960s when birth rates hit the peak after the Second World War, have sparked a sharper focus in the media. Public discourse in leading Western countries like the United States portrayed these older cohorts as a “problem generation” in contemporary society (Bristow, 2016; Phillipson et al., 2008) and a “demographic time-bomb” for future pension and healthcare systems. During the COVID-19 pandemic, many countries witnessed an upsurge in ageism toward older people. For example, hashtags like “boomer remover” went viral on social media in developed countries including the United States, mocking the coronavirus as a remover of older boomers.

However, not all people view the current demographic changes negatively. An increasing number of scholars have recognised that public policies can actively respond to the challenges of population ageing by re-configuring social and economic institutions and rebuilding generational contracts (Harper, 2014). Recent economic debates on the second demographic dividend add to the argument that providing incentives for people to proactively accumulate their human capital and wealth that fulfil their later-life consumption goals can boost productivity and harness economic growth in ageing societies (Mason & Lee, 2006; Williamson, 2013). More specifically, older populations are under-utilised human resources that must be supported by public policies that promote an opportunity-rich ageing workforce and safeguard economic well-being in later life (Bloom et al., 2010;

¹The data came from the author’s analysis of the World Population Prospects [WPP] 2024 data (UN, 2024). The medium variant of WPP projected data from 2024 to 2100 was used.

F. Cai, 2020). Figure 1.2 shows the population pyramids in China from 1950 to 2075. It could be anticipated that a steadily increasing number of older people will significantly reshape China's labour market because the share of younger workers will continue to decline in the decades to come. A new tipping point for economic development will be created through retaining older people in the workforce rather than pushing them out.

[Insert Figure 1.2 here]

For governments, one of the most prominent challenges of demographic ageing is the sustainability of pension funds. Decreasing shares of the working-age population have resulted in dramatically diminishing contributions to the pension fund, an alarming trend with no sign of deceleration. In response, most governments have transformed their defined-benefit pension systems into a defined-contribution mode. Furthermore, promoting extended working lives has also been viewed as an effective policy strategy to cope with population ageing. Policymakers in numerous advanced economies have been trying to reverse early exit trends and raise normal retirement ages (Ebbinghaus, 2006; Kohli, 1991). Based on the World Bank's databases (Azevedo, 2011), I visualised retirement ages with full benefit among 179 countries and regions in 2023 in Figure 1.3. The mean ages of retirement with full pension benefits for women and men were 63.72 and 64.45 in high-income regions, suggesting that most high-income countries have successfully increased their retirement ages. In the developing world, several countries have just brought retirement reforms into their policy-making agenda, while others have yet to make a change. For example, the figure shows that China not only had relatively lower retirement ages but also lagged behind other higher-middle or high-income countries in terms of reducing the gender gap. China's decade-long debates over retirement age reforms were officially resolved in 2024 by a national plan for gradually delaying retirement. The reforms will affect hundreds of millions of working adults in the future. However, governmental responses are incredibly complex and sometimes produce unintended consequences. Despite the progress, policy reforms encouraging employment extension in some developed economies have been found to provoke widespread anger (such as Macron's pension reform in France) and create new social inequalities. For example, in the United

Kingdom, researchers have observed that older workers from disadvantaged backgrounds are forced to remain in the ageing labour force and face adverse working conditions (Lain & Phillipson, 2019; Phillipson, 2019; Vickerstaff, 2010).

[Insert Figure 1.3 about here]

A key question has arisen: How can we support longer productive lives? Putting forward a plausible answer to this new question is never a piece of cake. Instead, researchers must delve deeper into the fundamental societal changes that happen to older workers. Unfortunately, our current knowledge has become divorced from the reality that the ongoing evolution of work and retirement unfolds in context. The long-term inadequate awareness of demographic ageing has impeded societal adaptations, a dilemma known as the “structural lag” (Riley et al., 1994). To take stock of prior wisdom and advance the understanding of work and retirement, this inquiry is primarily concerned with questions as to why people opt to work or retire in later years and how older workers fare in the ageing labour market, especially in a non-Western context.

1.2 Approaching Work and Retirement

Before proceeding to the study framework and questions, it is essential to clarify relevant concepts, the research approach, and the subjects of interest.

Retirement is a social institution that gained legitimacy through social security reforms in the early twentieth century (Atchley, 1982a). Since the Second World War, the development of welfare states has embedded the capitalist economy into an emerging moral economy that commodifies consumption goals through promoting lifetime work engagement and reciprocally providing older people with retirement pensions and related welfare (Kohli, 1986). The rise of the moral economy leads to a series of fundamental changes in the organisation of work and life, creating a tripartition of the life course (Kohli, 1986), in which individual lives are separated into three sequential stages, including preparation or education, work, and retirement or leisure. The expansion of welfare states created a powerful, rigid life course regime that regulated the rhythm of individual

lives. In the 1970s and 1980s, there was a clear consensus over the definition of retirement. Most prior researchers either from economics or sociology regarded retirement as a complete separation from career employment while living with a pension income (Atchley, 1982a; Atchley, 1982b; Guillemard & Rein, 1993; Lazear, 1979). At that time, retirement is viewed as a one-way event that concentrates on norm retirement ages and produces a high level of predictability.

However, this institutionalisation of retirement is bound to change. It is partly caused by governmental reforms that aim to roll back social welfare provisions and privatise the responsibility of old-age support to individuals. With changing policy regulations over retirement ages, social norms regarding the age-patterning of life-course transitions including work and retirement have evolved rapidly. Since the 1990s and, particularly, the turn of the new millennium, however, the meaning of retirement has evolved, making researchers increasingly unsatisfied with the traditional definition of retirement (e.g., Henkens et al., 2018; Henretta, 1997; Quinn et al., 1990; Schulz, 2002). Drawing from the idea of emerging adulthood, Moen (2016) proposed the concept of “encore adulthood” to capture the variable changes in mid-later years when older people break up the traditional age norms about career and retirement by taking active roles in the family, labour markets, and society. In a review, researchers summarised eight definitions of retirement, with each corresponding to specific measures and standards (Denton & Spencer, 2009). Qualitative studies have also illuminated that older people are redefining their retirement in more flexible and individualised ways (for example, Duberley et al., 2014; Kojola & Moen, 2016).

In this study, I adopted a broad definition of retirement, that is, actual retirement, rather than the narrow sense of formal retirement. Actual retirement is often defined by a combination of labour force participation and pension status (Denton & Spencer, 2009), that is, the transition from employment to non-employment of older workers after reaching pensionable ages. In many cases, actual retirement can be simplified into economic inactivity at mature ages (Giles et al., 2023), a definition commonly used by economists. In contrast, employment refers to engagement in paid work, regardless of

its forms (self-employed or employed), sectors (agricultural or non-agricultural), and life stages (before or after reaching pension ages). Following previous research of Greller and Simpson (1999) and North (2024), I define the late stage of career, namely the late-career stage, as working life among mature adults aged 50 or above. These mature workers are called “older workers” (McCarthy et al., 2014) because they are approaching or have already reached normal retirement ages. Therefore, late-career dynamics may involve complex, non-linear transitions between employment and retirement that can profoundly influence the lives of older workers and retirees.

The current understanding of work and retirement mostly comes from high-income Western economies (Henkens et al., 2018). Especially in the field of retirement reforms, most of these industrialised countries have introduced a considerable number of policy reform initiatives, which successfully reversed the trends toward early exit, and promoted labour force participation rates of middle-aged and older populations. Their shift from early-exit to late-exit arrangements has brought profound societal changes (Jensen, 2024), offering valuable lessons for the rest of the world. Research from Western societies has shown that older adults who are better-educated, higher-skilled, and healthy are more inclined to stay in the workforce longer, or return to the workforce after retirement, creating a new life period of “unretirement” (Maestas, 2010; Platts et al., 2019). In Nordic countries, it is reported that advantaged older workers often experience improved job quality, such as better psychosocial working conditions, after transitioning into bridge employment (Sacco et al., 2022; Wahrendorf et al., 2017), defined as working for pay while receiving a pension income. Therefore, retirement scholars claim that employment after reaching pension eligibility ages represents “a distinctive second stage in the late career which blends the second and third age” (Platts et al., 2023, p.1310).

With the advancement of demographic ageing, most middle- and low-income countries in the developing world are encountering an unavoidable need to adjust their public policies and institutional arrangements, and many of them have already implemented several rounds of pension and retirement reforms. Because numerous developing countries lack a universal, generous pension support system, their landscape of work and retirement

can be distinctive in various ways. For example, researchers have noticed that disadvantaged workers may be more likely to prolong their working lives in East and Southern Asian countries (O’Keefe et al., 2021; Turek et al., 2024). Giles et al. (2023) argue that China’s retirement protection regime is featured by the formula of “one country, two systems” where formal and informal retirements create enormous inequalities. Hence, evidence from non-Western settings can provide new insights into older people’s retirement decisions. Nevertheless, key issues about retirement in these emergent economies have received comparatively less attention.

A small fraction of researchers are documenting recent trends in pension reforms, their achievements, and potential challenges in some middle- and low-income regions, such as China (Y. Cai & Cheng, 2014; Kudrna et al., 2023; T. Liu & Sun, 2016; H. Wang & Huang, 2023). Research on pension reforms is predominantly concerned with why and how governments initiate policy changes to alleviate the forthcoming deficit crisis of pension systems or to respond to the developmental impacts of population ageing (e.g., Holzmann, 2013; X. Wang et al., 2016). Comparative pension studies have revealed the deeper institutional logics of pension politics and nation-state actors that pension and retirement reforms are always embedded in the world society (Meyer, 2010) and to a large extent are shaped by international organisations like the International Labour Organisation (ILO), United Nations (UN), and Organisation for Economic Co-operation and Development (OECD), to name a few, and reform pioneers in the developed world. However, discussions on pension systems and pension reforms are dominated by the perspectives of top-ranked decision-makers, leaving (older) workers’ perspectives largely understated. This problem is particularly prominent in the studies of pension and retirement landscapes in rapidly ageing and non-Western countries.

Unprecedented demographic transitions are unfolding dramatically and will evolve much faster in the following decades in numerous developing countries, where the lion’s share of the world’s fast-greying populations work and live. Undoubtedly, China will catch up with many developed countries soon in terms of the degree of population ageing. In the future, when China becomes older than European countries (UN, 2023), which have

been trying to slow their ageing processes by encouraging replacement migration, people from the broader Global South (here I mean the vast majority of middle and low-income regions) will be very likely to wonder why such an alarming population prospect emerges in their own country, to look back to the policy efforts in today's leading developing economies, and to evaluate how working populations, especially workers of mature ages, fare in their ageing labour market.

Along with the justification for studying work and retirement in China are two fundamental epistemological propositions that underpin this dissertation. The first proposition relates to a social epistemology, which considers local contexts and knowledge as socially and historically constructed (Pascale, 2010). Researchers speaking of findings from a non-Western country must deal carefully with the relations of local retirement landscapes to the socio-demographic transitions and policy reforms in developed countries. I aspire not to emphasise how Chinese society and institutions are distinct from other settings but to debunk the extent to which China's work and retirement phenomena may deserve the attention of political actors, researchers, business owners, and practitioners worldwide. China has carried out a series of retirement and pension reforms, with some aspects learned from existing practices, such as individual pension plans, from other regions and other aspects failing to keep pace with current demographic transitions. Due to institutional inertia (Moen, 2016), these experiences may not necessarily serve as a reference point for Western pioneers in retirement reforms.

Nonetheless, China has offered valuable lessons to the international intellectual and policy community, such as efforts to bridge gaps in socio-economic mobility, unify multi-layered retirement protections, and encourage productive ageing. A growing number of developing societies increasingly threatened by the vanishing demographic dividend and the pension crisis may find it worthwhile to learn, emulate, and transcend China's experience. Therefore, a case study does not particularise knowledge (Burawoy, 2016) specific to only one locale but aims to discover the changing dynamics of retirement that an ageing giant in the globalised world is experiencing and other developing regions will likely encounter soon.

Another proposition is based on a structural approach. As a student of sociology, a key consideration for me is how to advance the sociological understanding of work and retirement. The reasons for taking a sociological approach rather than a perspective from economics or psychology are twofold. First, sociology provides a rich set of theoretical toolkits of work and retirement, which can be dated back to the 1950s. The sociological perspective of retirement situates older workers and retirees in a social, historical, and ecological context (Henretta, 1997; J. E. Kim & Moen, 2002; Moen, 2012), enabling the identification of the environmental constraints around retirement and the examination of how older people exert their agency. Based on this, this study attempts to offer a structural, rather than individualistic, explanation of “who retires, when, and why” (Quinn et al., 1990, p.4).

Second, social inequality constitutes a pivot point of structural thinking. In later adulthood, inequality, vulnerability, and precarity are particularly relevant to older people, both within and outside the labour market. In 2011, economist Guy Standing coined the concept of the “precariat” (Standing, 2011), referring to a growing proportion of workers lacking socio-economic security and occupational identity. The ageing process compounded with adverse labour market conditions has elevated the precarious experiences of most, if not all, older workers. In the United Kingdom, for example, some scholars have explored how the family, welfare state, and the labour market produce the precarity of older workers (Lain et al., 2019). Moving beyond employment insecurity, researchers have stressed that social class stratifies retirement decisions (Radl, 2013) and social inequality can increase after retirement (O’rand & Henretta, 1999). Based on life-course theory, theories of retirement, social stratification theory, and neighbourhood effect perspective, this study will identify how socio-economic resources at various levels and institutional barriers, such as the urban-rural divide, the household registration system (namely, hukou), and the pension system, configure late-career opportunities, retirement choices, and post-retirement life chances in China.

1.3 Theoretical Framework: Putting Work and Retirement into Contexts

Can we understand work and retirement better? More specifically, can we offer an in-depth analysis of late-career dynamics in China from a sociological perspective? Any intellectual attempt to research work and retirement in China will be difficult because researchers must carefully deal with the practical challenges raised by a country with an extensive territory, the world's second-largest population, and extremely fragmented welfare systems. In public policy, retirement is one of the "wicked problems" (Rittel & Webber, 1973) that have perplexed governments and policymakers across the globe for decades. Knowing that a comprehensive investigation of work and retirement is impossible for a dissertation, I aim to uncover the interplay of social change, the labour market, and social welfare that affects retirement opportunity structures and the post-retirement well-being of older people by focusing on several key movements in recent great transformations of the Chinese society.

Specifically, I focus on the two important but overlooked dynamics of work and retirement, namely temporal and spatial dynamics. The main reason why these dimensions, instead of the others, were chosen is quite straightforward. We have learned much from the current literature that retirement decisions are shaped by various pre- and peri-retirement work and non-work factors, notably finance, pre-retirement job conditions, family, health, and psychological factors (Beehr, 2014; Fisher et al., 2016; Scharn et al., 2018; S. E. Sullivan & Al Ariss, 2019; M. Wang & Shi, 2014; M. Wang & Shultz, 2010; M. Wang et al., 2011). Despite the growing interest in life course antecedents of retirement and bridge employment, researchers focus exclusively on family and employment experiences in middle and later adulthood. Some scholars have discussed the temporality of work and retirement based on the life course theory, pointing out the importance of biographic pacing (Han & Moen, 1999). The interdependence of employment and retirement decisions within the family and community contexts has also received some attention (Szinovacz, 2012), but a deeper investigation of the neighbourhood and household influ-

ences is lacking. In non-Western settings, especially in China, where family members and neighbourhood relations can influence individual lives more profoundly (Fei, 1992), an understanding of retirement must situate itself into the broader life course contexts. In one short essay, sociologist Phyllis Moen laments that “Much of the research to date on the changing retirement transition seeks antecedents explaining retirement decisions but fails to capture the biographical, relational, temporal, and spatial contexts and dynamics of these decisions” (Moen, 2012, p.552). In another essay written for public readers, she bluntly criticises that “everything we think we know about retirement is wrong.” (Moen, 2010, p.86). As a response, this dissertation represents my early efforts in advancing our understanding of the life-course dynamics of work and retirement in China.

Temporality is one of life course theory’s fundamental principles. Conceptually, temporality is related to age-related processes at individual and societal levels (Riley, 1987). First, for individuals, the process of ageing involves a sequence of changes in physical status, mental states, and behaviours (Johfre & Saperstein, 2023). Hence, the life course can be viewed as a long-term development process in which previous experiences and choices will have a certain degree of influence on subsequent life experiences. Second, at the societal level, these age-patterned changes are further institutionalised and standardised as social norms and expectations that can regulate individual attitudes and behaviours (Riley, 1987). Third, the temporality of the life course also emphasises the interaction between individual choices and structural constraints to shape individual life courses. Influenced by strong social norms, life trajectories will continue to converge, reducing intra-cohort differentiation. However, when diverse career and life choices emerge, life-course trajectories will be gradually de-standardised and differentiated.

The temporal perspective has important theoretical implications for research on work and retirement. Because the retirement system, as a product of the historical times, can prominently reinforce the age norms of labour force participation. The mandatory retirement policies allow employers to dismiss employees when they reach a certain age, regardless of older workers’ willingness to continue working and ability to perform their current job tasks (Lazear, 1979). The economic assumption is that older workers’ produc-

tivity decreases with age while their wages increase with seniority (Skirbekk, 2004). From the economic perspective, mandatory retirement may align more closely with employers' economic goals for profit maximisation rather than employees' interests.

From an employee's point of view, the temporal rhythm of retirement is deeply rooted in both proximal and distal life-course contexts. There are several reasons for this temporal embeddedness. First, the career path itself is associated with certain retirement schedules (Henretta, 1997). For example, a young employee working in the public sector can easily foresee when they will end their career and become a retiree. As Ekerdt (2004) and Moen (2012) have pointed out, retirement is not something that happens later in life, but a life-long project that develops over the entire career, and even starts in early life. Second, socio-economic attainments over the life course can affect retirement decisions. For employees, choosing to retire means a significant change in major income sources. Socio-economic resources accumulated through long-term work could result in greater differentiation in retirement protections (O'Rand, 1996). In settings with under-developed retirement welfare, people with better income conditions and more retirement wealth may be more willing to accept a complete retirement and start to enjoy leisure in their later years. On the contrary, for older groups with less social and economic resources, retirement can be an unrealistic choice when lacking decent pension incomes.

The second dimension is spatiality. The life course theory suggests that life transitions are embedded in not only historical times but also spatial contexts (Elder, 2003; Elder et al., 2003). Interestingly, when Elder et al. (2003) were illustrating social or historical space, they mentioned the case of relocated young Chinese adults during the Cultural Revolution. The "Sent-Down" movement brought about a series of changes in residential places, leading to a lasting impact on the life-course development in these cohorts. Nonetheless, their emphasis on the role of place has not received much attention in retirement research. The questions as to whether and how the place may affect life chances in late careers remain unanswered in most studies on work and retirement.

The spatial dynamics of retirement could be studied from at least two aspects, namely differential exposure and differential reception (Browning et al., 2016). First, differential

exposure refers to the process in which spatial exposures to local environments, such as a neighbourhood, vary by time and space among residents. Neighbourhood resources can affect individuals' opportunities in the labour market, both directly and indirectly, through a variety of internal and external mechanisms (G. C. Galster, 2012), such as socialisation and skill mismatch. In the later stage of career development, older workers can formulate retirement plans through informal social participation and social interactions (Lancee & Radl, 2012; Litwin & Tur-Sinai, 2015). In this sense, the neighbourhood, as a social space, fosters cultural values and social norms regarding work and retirement transitions (M. Kim & Beehr, 2018). As a result, unequal access to neighbourhood resources may contribute to the differentiation of career development and retirement life (O'Rand, 2002).

According to Browning et al. (2016), differential reception implies that individuals can strategically respond to their environments, leading to different influences of the places on residents. This idea has long been recognised by the environmental docility hypothesis (Lawton & Simon, 1968), which suggests that older people with more competence and resources are usually less susceptible to neighbourhood environments, whereas less competent residents tend to depend on their external environments. The interaction between the places and individuals may have important implications for later career outcomes, such as the transition into retirement and post-retirement employment.

While neighbourhood effects on employment have attracted much attention from economists, neighbourhood researchers, and sociologists, most empirical studies are concerned about how neighbourhood affects labour market outcomes in young adulthood. For example, in the United States, numerous scholars have evaluated the effectiveness of "Moving to Opportunity", a randomised housing mobility experiment that offers housing vouchers for families living in high-poverty neighbourhoods to move to a better place, showing that young people can achieve greater social mobility in the labour market after moving out from disadvantaged communities (Chetty & Hendren, 2018a, 2018b). Given the salient effects of neighbourhood contexts and internal migration on young people's employment, it could also be expected that the places, including residential contexts and

residential change, may influence the retirement and economic well-being of middle-aged and older people.

Temporality and spatiality form the foundation of my understanding of work and retirement in this study. It is important to note that these dynamics do not exist in isolation. Their ongoing interactions can have a decisive impact on the retirement transition experiences and the quality of life in retirement. One of the major advantages of this framework lies in its potential for debunking the complexities of work and retirement in context. Over the past few decades, retirement scholars have been trying to develop and synthesise theories to contextualise the processes or contexts of retirement. In a recent review, Henkens and van Solinge (2021) summarised three perspectives for understanding retirement: institutional, organisational, and household contexts. The emphasis on the organisational perspective is absent in the present study because I focus on the general older population rather than older employees. In the multi-level perspective of retirement (Beehr & Bennett, 2007; M. Kim & Beehr, 2018; Szinovacz, 2003, 2012), researchers posit that retirement decisions represent a deliberate evaluation of their retirement opportunity structures formed by the individual factors, organisational environments, and the larger society. This perspective makes certain connections between spatial processes of retirement, but the overall linkages seem to be geographically and hierarchically assembled. Lacking synergy between spatial and temporal contexts over the life course that contour the landscape of retirement, researchers are unable to develop retirement-related theories that reflect social changes.

The central concern here is how these life-course temporal and spatial dynamics jointly shape the inequalities in work and retirement. Twenty years ago, O'rand and Henretta (1999) ever argued in their book titled "Age And Inequality: Diverse Pathways Through Later Life" that different retirement paths could increase economic inequality in later life. They stressed that this inequality is the result of resource accumulation over a long period of life. The cumulative advantage perspective (DiPrete & Eirich, 2006) points out that occupational experience and labour market segmentation are important mechanisms that lead to inequality at prime working ages. In a recent article, theorists emphasise that

the welfare state and social policies at the macro levels may either reduce or accentuate life-course inequality (Dannefer, 2020). To understand the origins of inequalities in work and retirement, it is important to investigate how social policies, especially the pension system, interact with individual or family resources to affect unequal late-career outcomes.

[Insert Figure 1.4 here]

I propose an integrative theoretical framework to advance the understanding of work and retirement from a life course perspective (Figure 1.4). Unlike existing theories of retirement, this framework innovatively incorporates the temporal and spatial dynamics in which late-career dynamics unfold. As for temporal dynamics, I focus on the accumulation of socio-economic resources at various life stages as well as internal migration biographies that differentiate migrants and non-migrants from the same place of origin. The spatial dynamics include not only differential exposure to neighbourhood socio-economic conditions but also differential reception through internal migration. Another distinction of this framework is the explicit emphasis on the ongoing interactions between welfare contexts and individuals that influence life chances before and after entering late careers. In adulthood, welfare contexts can affect resource accumulation, neighbourhood exposures, and life-course agency. In late careers, welfare policies, especially the pension system, are expected to powerfully and directly affect retirement opportunity structures. The ageing of baby boomers is reshaping the landscape of retirement at the same time, imposing growing pressure on policymakers to change the institutional status quo and respond to the needs of older workers and retirees.

1.4 Institutional Context: The Chinese Retirement and Pension Policies

In Asian societies, China was among the earliest adopters of modern pension and retirement welfare systems (World Bank, 2016). After decades of war, the newborn Chinese government established a pension system in the 1950s based on the Soviet Union's post-war welfare practices. Over the past few decades, drastic demographic and societal

changes have turned China from a relatively young country into an aged society, raising a series of new challenges to not only policy-makers but also ageing individuals. Despite minor modifications, retirement age policies remained unchanged for decades before 2025. I will briefly illustrate the development of China's pension and retirement system below.

China established its first official retirement policy in the early 1950s. In the "Labour Insurance Regulation" promulgated in 1951, the mandatory retirement age was set at 60 for male employees and 50 for female employees. In 1955, the State Council raised the mandatory retirement age for female cadres by five years to age 55. Under a socialist economy, the pension system mainly covered urban employees working in the government, public institutions (such as public schools and hospitals), and state-owned enterprises, known as *danwei*. Employers were responsible for providing pension benefits to their retirees following a pay-as-you-go style (Béland & Yu, 2004).

In the late 1970s, with the adoption of market-based economic reforms, the State Council extended the retirement policies to private enterprises and introduced early retirement policies. It stipulates two conditions for early retirement. First, with physically demanding or health-damaging jobs, female workers aged 45 or above and male workers aged 55 or above could retire early. Second, if losing the ability to work due to disability, early withdrawal is allowed for female workers aged 45 or above and male workers aged 50 or above. Both normal and early/disability retirement require at least ten years of work tenure. In response to the mounting pension expenditures, the central government put forward a two-part pension system that consisted of earning-based contributions and individual saving accounts in the 1980s and 1990s (T. Liu & Sun, 2016). In 1997, the pension system reform proposed a Basic Pension Fund managed by local government authorities rather than enterprises. Five years later, in 2004, the enterprise annuity scheme was introduced to serve as a supplemental private pension.

Unlike private employees, civil servants in the government and employees in public service units (*shiye danwei*) used to receive non-contributory pension benefits subsidised by public finance. Since 2014, the Chinese government has laid out reforms integrating the old age pension for employees in government and public institutions (GIP) with the

enterprise employee basic pension (EEBP). However, the conventional retirement and pension policies were urban- and enterprise-based (T. Liu & Sun, 2016). During the last two decades, prominent policy changes have been made to protect other workers and residents. In urban areas, the Urban Resident Social Pension (URSP) was established to cover self-employed and non-employed residents in 2011 when the Social Insurance Law became effective. In the rural areas, the government replaced the old rural pension (RSP) system with a New Rural Social Pension (NRSP) in 2008. Aiming to eliminate the long-standing rural-urban divides, the pension schemes for rural and urban residents were further integrated into a universal Urban-Rural Resident Social Pension (URRSP) in 2014. According to the Social Insurance Law, the full pension age is set at age 60 for older adults who have voluntarily contributed to the resident pension schemes for at least 15 years. In 2022, China introduced individual pensions—defined-contribution schemes offered by commercial banks and financial platforms that encourage voluntary participation among adults enrolled in employment- and/or resident-based pension schemes—to build a multi-pillar retirement support system.

In September 2024, the 11th session of the Standing Committee of the 14th National People's Congress approved a formal plan for gradually delaying the statutory retirement ages in China. Under this reform plan, the retirement ages of male workers and female cadres will be increased by three years to 63 and 58 over the next 15 years (from 2025 to 2040), respectively, while raising the statutory retirement age for female blue-collar workers by five years to 55. Meanwhile, the plan also implements strict restrictions to prevent older workers from processing retirement procedures before their previous statutory retirement ages (i.e., 50 for female blue-collar workers, 55 for female cadres/white-collar workers, and 60 for male workers), meaning that the original internal and early retirement routes will be replaced with more flexible early retirements. To support longer working lives, the Chinese government has issued new policies encouraging older workers to voluntarily delay their retirements by no more than three years after reaching their new statutory retirement ages. Moreover, starting in 2030, the minimum number of years of pension contribution will be extended from 15 to 20 years, with an annual increase of

six months.

Despite extraordinary achievements in improving pension insurance coverage, enduring inequalities in retirement welfare provision have posed a key challenge to China's social policy system. Many Chinese scholars have observed a shift from the residual model to "an appropriate universal type" (S. Wang, 2009) or "stratified universalism" (M. Li et al., 2021) in China's social welfare. First, access to pension insurance rights is highly stratified by the area of residence and household registration. Rural residents and rural-to-urban migrants are typically enrolled in resident social pension plans and face persistent barriers to participating in employment-based pension programmes as equal to urban workers. Second, there is a huge gap in retirement between Chinese men and women. Because Chinese women workers can retire in their fifties, they also have an exceptionally longer post-retirement life span than women in developed countries. Third, occupation-based stratification is embodied in China's retirement protection system. On the one hand, workers in the public sector and higher occupational positions often have more privileged retirement protections than lower-status, private workers. On the other hand, women blue-collar workers and cadres have different retirement age policies, implying that the newly released retirement reform plan will affect the former group's late working life more drastically. Therefore, current knowledge of work and retirement in China cannot be advanced unless researchers pay sufficient attention to the roles of social stratification in shaping late careers.

China's dual retirement regime (Giles et al., 2023), formed by employment- and resident-based pension systems, has produced inherent institutional differences. The resident-based pension system comprises the GIP and EEBP, as well as an annuity plan that provides supplementary pension benefits by a limited but growing number of employers. The GIP offer retirees the highest pension benefits compared to the EEBP (C. Liu, Zhou, & Bai, 2021; Zhu & Walker, 2018) and other pension plans. In 2024, the GIP was finally merged with the EEBP, creating a unified urban employee basic pension system. In contrast, resident-based pension schemes can only provide minimal pension benefits to older pensioners. Table 1.1 shows the estimated pension benefits of employee

and resident social pension schemes from 2012 to 2023. On average, an older adult enrolled in the resident pension schemes can receive about 223 yuan per month in 2023, whereas a retired employee could receive 3,743 yuan per month. The sizeable pension gaps between schemes will likely lead to divergent retirement decisions. Studies have reported that disadvantaged older residents, especially rural residents and migrants from rural areas, tend to prolong their working life in later adulthood (de Brauw & Rozelle, 2004; Giles et al., 2023; Q. Zhang & Wu, 2023). Although China's nationwide plan for gradually delaying retirement has already taken effect in January 2025, the landscape of retirement will not change dramatically in the short term (for example, five years). For this reason, tens of millions of older Chinese workers enrolled in employment-based pension programmes will still retire around or before age 60.

[Insert Table 1.1 here]

1.5 The Present Research

Illuminating the life-course contexts and consequences of late-career decisions in China is the primary objective of this research. I break down this objective into two core research aims. First, it deals with the socio-economic determinants of late-career behaviours. Based on a life course perspective, I will integrate the life-course temporal and spatial contexts to understand the retirement decision-making process. These efforts can enrich and expand the current understanding of retirement by linking life-course resource acquisition, neighbourhood attainment, and residential mobility to the retirement process. There will be four key research questions regarding retirement in context that need to be answered in the present research: (1) How do socio-economic resources affect retirement decisions? (2) What are the roles of the neighbourhood in retirement decision-making? (3) How do individual and family resources interact with neighbourhood resources in retirement decision-making? (4) To what extent and for whom does internal migration affect retirement decision-making?

In Chapter 2, I will delve deeper into the life-course temporal dynamics of retirement

by examining the influences of socio-economic resources from childhood to mid-later adulthood on later-life employment. Then, in Chapter 3, I address the second and third questions related to the spatial context of retirement. Because these two chapters do not consider older migrants who have migrated to other destinations to seek a better life, Chapter 4 will focus on the relationships between migration and retirement. I will investigate whether migrants and non-migrants differ in bridge employment and how economic mobility and welfare exclusion can explain older migrants' retirement decisions.

Second, it further attempts to examine whether and how late-career engagement is associated with the mortality risk of older adults. I choose all-cause mortality as the health outcome of interest because longevity is the ultimate pursuit of humankind. However, the selective mortality literature (Zajacova & Burgard, 2013) suggests that mortality risks increase in old age, especially among disadvantaged groups. Hence, identifying whether, when, and for whom employment may protect against mortality later in life is crucial for policymakers to design policy options to address the economic and health burden of population ageing.

In Chapter 5, I will examine the health consequences of late-career engagement in China by answering the following two questions: (5) Is late-career engagement associated with all-cause mortality in older Chinese adults? (6) Does the association between late-career engagement and all-cause mortality vary by demographic and socio-economic characteristics?

1.6 Overview of the Dissertation

The thesis will proceed in four empirical chapters together with a general discussion. Although the content is orderly arranged, each chapter deals with its specific research objectives and does not require much prior background knowledge from readers unfamiliar with the topic. Because of its emphasis on social inequality, the preceding chapters can provide more detailed explanations for the life-course dynamics of divergent retirement decisions in older Chinese adults.

Chapter 2 lays the foundation for the whole dissertation by investigating how socio-economic resources at various life stages affect later-life employment in urban China. By drawing from social stratification and mobility perspectives, this chapter interrogates the effects of lifetime socio-economic status on later-life employment. It also explores the social mobility and welfare modification mechanisms in the relationships between socio-economic resources and retirement decision-making. The attention to lifetime socio-economic resources calls for a renewed understanding of work and retirement that considers retirement planning a life-long project embedded in the biographic and socio-economic context over the life course.

In Chapter 3, I expand the research on retirement decisions to the neighbourhood context by articulating the complex relationships between neighbourhood socio-economic resources and labour market exit. While Chapter 2 demonstrates an overall negative association between individual socio-economic resources and later-life employment, the neighbourhood effect on retirement may be more complex. It argues that the neighbourhood effects on retirement are non-linear and heterogeneous because older workers may respond differently to neighbourhood resource environments. This chapter will examine the interplay between individual, household, and neighbourhood resources in shaping retirement decisions.

The primary objective of Chapter 4 is to investigate whether and how residential mobility can change economic opportunities and welfare situations, thereby leading to long-term effects on employment after pensionable ages. This chapter will establish a theoretical linkage between internal migration and retirement and compare migrants and non-migrants of the same places of origin and destination. It will take advantage of residential history data to profile various features of internal migrant experience indicative of socio-economic mobility and welfare exclusion. This chapter will identify for whom internal migration experience may be positively or negatively associated with employment continuity after reaching pension eligibility ages.

In Chapter 5, I will explore whether and how later-career engagement is associated with all-cause mortality in mid-later adulthood. This chapter proposes that employment,

particularly employment continuity, can reduce the risk of all-cause mortality. By comparing the risk of all-cause mortality between different late-career groups, this chapter will identify which and when older people can gain more longevity benefits from workforce participation.

Chapter 6 summarises the key findings of the four chapters mentioned above. It also discusses the overarching implications of these findings for research and practice, giving special attention to middle- and low-income, ageing societies. As a concluding chapter, it will respond to my research questions in the background and discuss possible ways to build a new, sociological understanding of work and retirement in China.

Throughout the thesis, I emphasised how the interplay between socio-economic resources and meso- and macro-level institutions jointly produce long-lasting (dis)advantages that differentiate retirement opportunity structures before and after reaching pension eligibility ages. As such, retirement-related inequalities are deeply rooted in the broader life-course contexts that cannot remain unchecked. The importance and urgency of addressing resource deficits in various pre-retirement life domains that may influence security and health in retirement could be recognised in current and future policy responses to demographic ageing.

Table 1.1. Pension income per capita in China, 2012–2023.

Year	Employee basic pension		Resident social pension		Pension income gap		
	Annual pension income ^a	Monthly pension income ^a	Annual pension income ^a	Monthly pension income ^a	Annual gap ^a	Monthly gap ^a	E/R ratio ^b
2012	20,900.39	1,741.70	859.13	71.59	20,041.26	1,670.10	24.33
2013	22,970.28	1,914.19	954.73	79.56	22,015.55	1,834.63	24.06
2014	25,315.59	2,109.63	1,097.77	91.48	24,217.82	2,018.15	23.06
2015	28,235.60	2,352.97	1,430.17	119.18	26,805.42	2,233.79	19.74
2016	31,527.80	2,627.32	1,408.29	117.36	30,119.51	2,509.96	22.39
2017	34,511.64	2,875.97	1,520.85	126.74	32,990.80	2,749.23	22.69
2018	37,842.04	3,153.50	1,827.58	152.30	36,014.46	3,001.21	20.71
2019	39,988.95	3,332.41	1,942.56	161.88	38,046.39	3,170.53	20.59
2020	40,197.61	3,349.80	2,088.04	174.00	38,109.58	3,175.80	19.25
2021	42,928.86	3,577.40	2,291.33	190.94	40,637.53	3,386.46	18.74
2022	43,267.88	3,605.66	2,456.42	204.70	40,811.46	3,400.96	17.61
2023	44,912.93	3,742.74	2,671.31	222.61	42,241.62	3,520.13	16.81

Notes: ^aThe unit of estimates is renminbi (RMB) yuan. The table presents the author's calculations based on official statistics from the National Bureau of Statistics of China (<https://data.stats.gov.cn/>) on the number of pension recipients and annual pension fund expenditures. ^bThe E/R ratio is computed by dividing employee pension income by resident pension income.

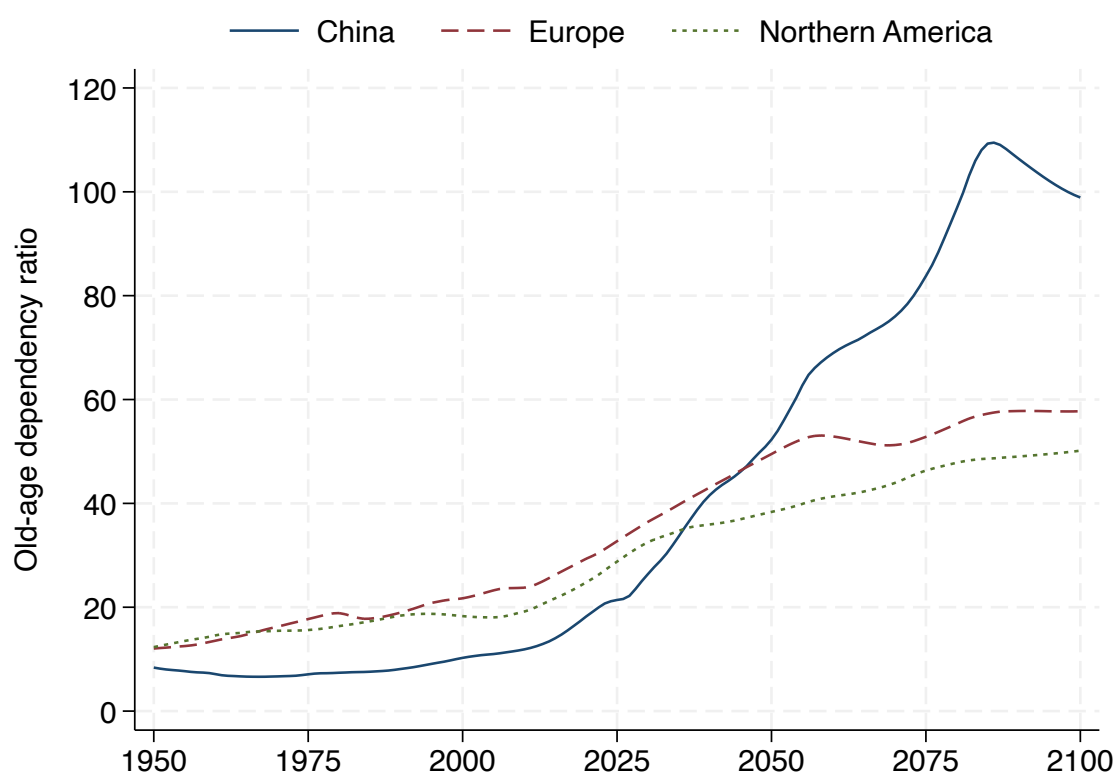


Figure 1.1. Trends in old-age dependency ratio in China, Europe, and Northern America from 1950 to 2100.

Note: The author's calculations were based on data from the United Nations (2024). The old-age dependency ratio refers to the number of older people (65 years or above, typically assumed as non-working adults) per 100 working-age adults (15–64 years old).

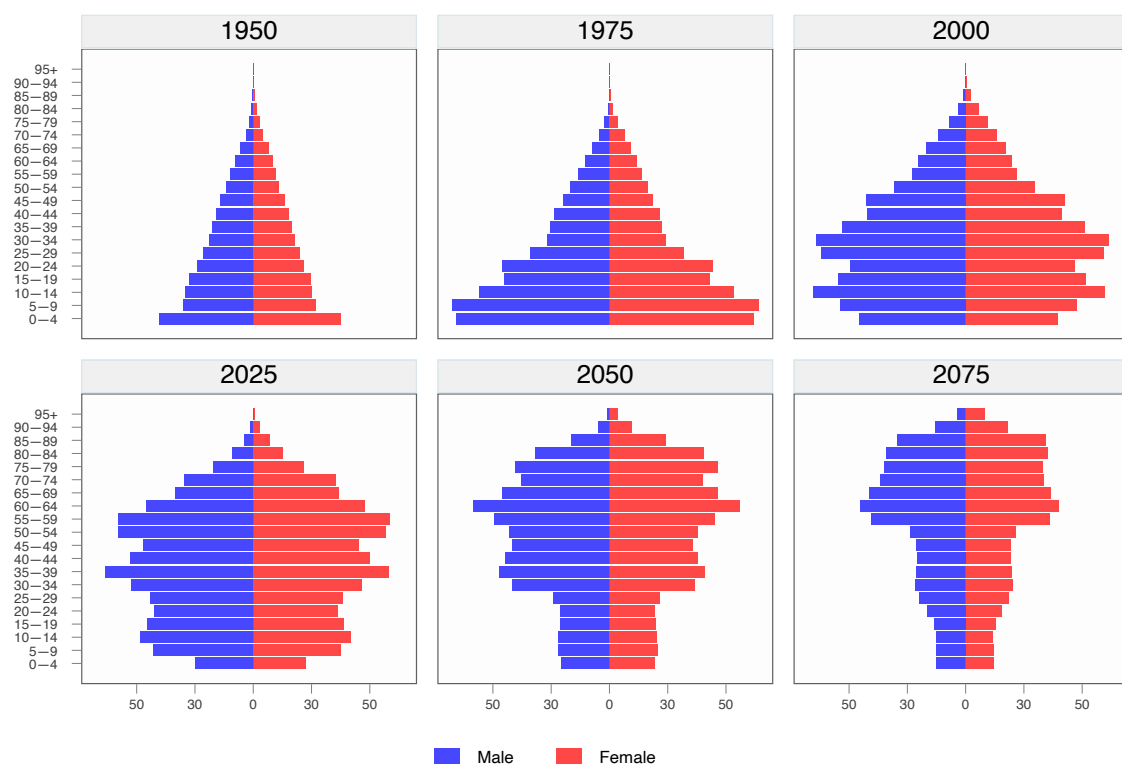


Figure 1.2. Population pyramids of China from 1950 to 2075 (in millions).

Note: The author's calculations were based on data from the United Nations (2024).

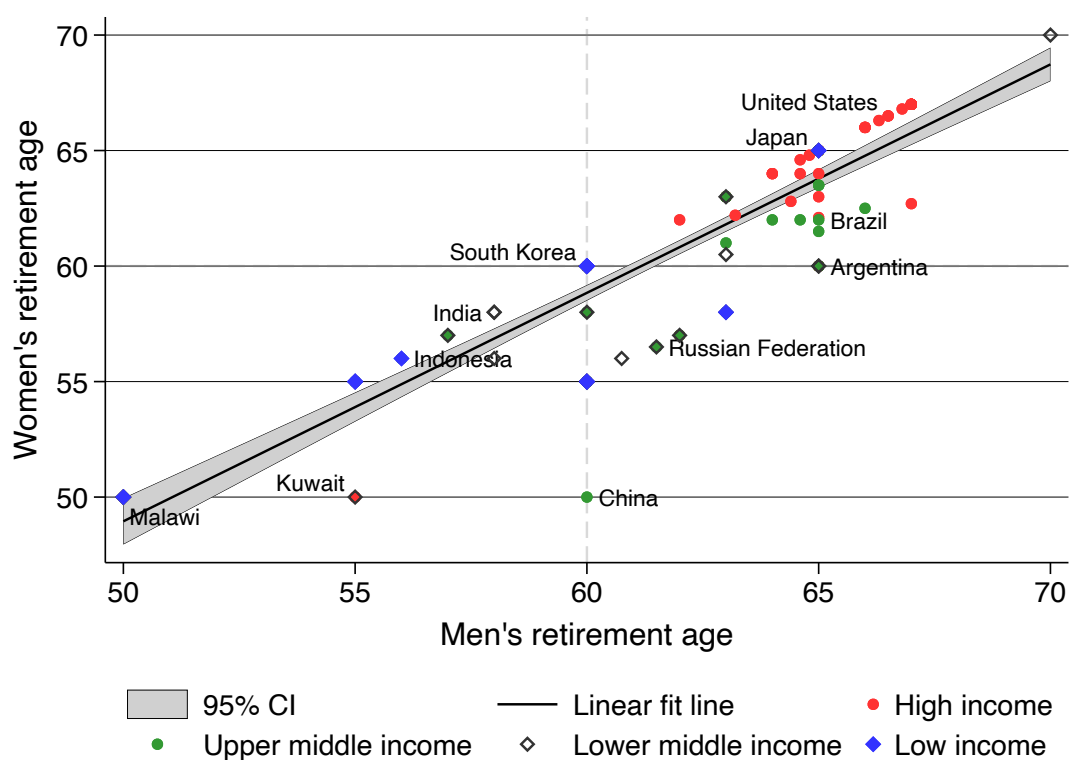


Figure 1.3. Retirement ages with full benefits in regions by income levels, 2023 (in years).

Notes: The data were retrieved from the World Bank's open databases. To avoid overlap, selected labels are shown.

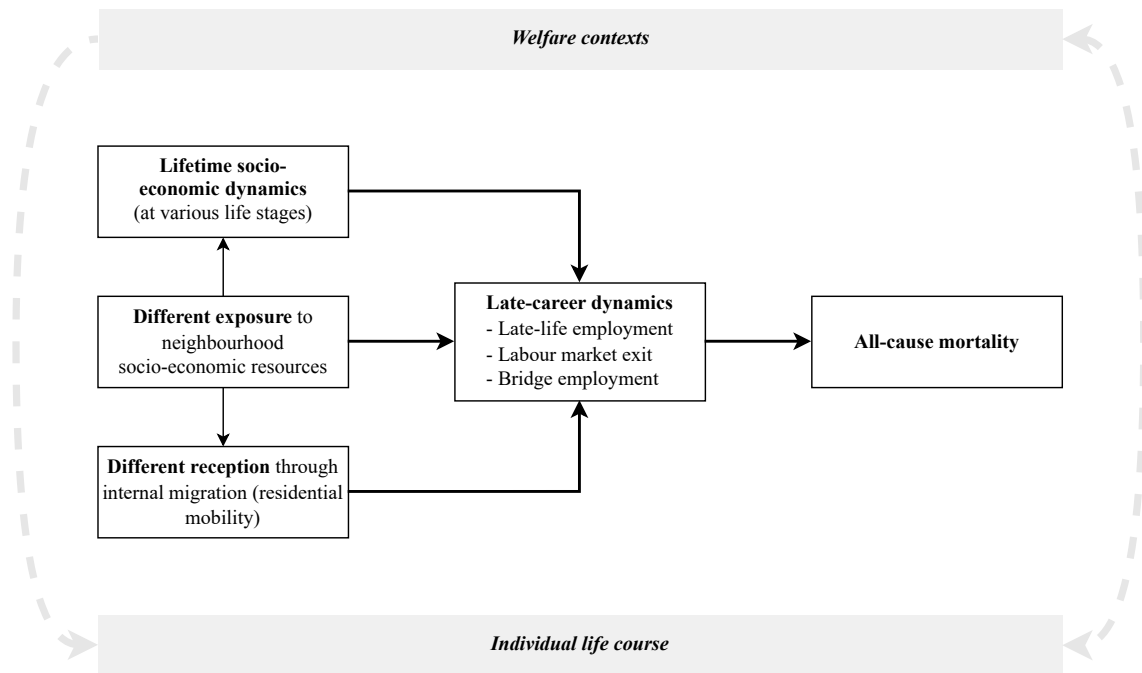


Figure 1.4. Theoretical framework of work and retirement in life-course temporal, spatial, and welfare contexts.

Chapter 2

Born to Work Longer?

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Born to Work Longer? Lifetime Socio-economic Dynamics, Pension Eligibility, and Late-Life Employment in Urban China

Abstract: The expansion of extended working life has been recently reported world-wide. While retirement researchers debate socio-economic inequalities in late careers in high-income Western countries, knowledge about unequal retirement choices in China remains limited. This study investigated the temporal socio-economic dynamics of late-career behaviours, especially after pensionable ages, from the perspectives of life course and social stratification and mobility. Using prospective survey data from the China Health and Retirement Study (CHARLS) 2011–2020 and its retrospective survey data collected in 2014, I assessed socio-economic scores (SES) from childhood to mid-later adulthood and identified four social mobility trajectories of 3,375 older adults in urban China. The results showed that SES in young and mid-later adulthood had negative effects on late-life employment, but childhood SES was positively associated with employment. Compared to stably low status and downward mobility trajectories, upward mobility and stably high status were advantaged trajectories that reduced the odds of employment. The effects of lifetime SES and socio-economic trajectories on employment emerged mainly after reaching pensionable ages. Further analyses revealed that financial necessity constituted a key mechanism underlying socio-economic inequalities in late-career behaviours due to widening pension gaps, hukou-based welfare rights, and family financial needs. The findings indicate that the life-course process of socio-economic attainments and mobility interacts with macro-level welfare systems to differentiate retirement choices in China. Implications of diminishing early advantages caused by life interruptions in pre-reform periods require attention because of growing intergenerational persistence. Intensified socio-economic inequalities in later life highlight the importance of improving policy and service interventions to reduce disadvantages in earlier working careers while providing better retirement protections and employment opportunities for older people.

Keywords: Late-life employment, Life course, Pension, Retirement decisions, Social mobility, Urban China

2.1 Introduction

The recent expansion of extended working life is one of the most notable phenomena in the labour market (Fideler, 2020). The massive uptake of post-retirement work or bridge jobs has led to a rapidly growing share of working pensioners worldwide (Dingemans et al., 2017). A rising proportion of older workers in developed countries have been retained in the workforce over the past decade, due to reform initiatives that curtail early retirement, promote active ageing, and foster the development of age-friendly labour markets. For example, more than 60% of older American workers take up bridge jobs after leaving career employment (Cahill et al., 2015). Even in developing Asian countries, such as China, the ageing workforce is increasing at an unprecedented rate (O’Keefe et al., 2021).

Identifying socio-economic inequalities in retirement is essential for advancing research and policy regarding the ageing labour market and older workers. However, contemporary retirement research has been largely hampered by inconsistent findings of inequalities in retirement (Fisher et al., 2016). Recent literature indicates a typical trend that advantaged older workers (e.g., better education and higher occupational status) tend to delay retirement through bridge employment, referring to working for pay while receiving a pension income or after retirement (Beehr & Bennett, 2015; Dingemans et al., 2017), mostly out of intrinsic rather than extrinsic motivations (Mazumdar et al., 2021; Platts et al., 2023). Influenced by policy interventions, low-status and impoverished workers who used to favour early retirement (Hofäcker et al., 2016), also continue to work beyond pensionable ages. This leads to a growing number of studies showing that the relationships between socio-economic resources in retirement and post-retirement employment are very weak or even absent (Cahill et al., 2017, 2024; Leinonen et al., 2020; Platts & Glaser, 2024). In contrast, a few researchers claim that retirement reforms and socially stratified vulnerabilities are making longer working life a financial necessity for many disadvantaged older workers (Lain & Phillipson, 2019; Madero-Cabib, 2015; Vickerstaff, 2010). Radl (2013) declares that “the primacy of class thesis” deserves sufficient scholarly attention when looking at retirement. Because much conventional wisdom about

retirement has been centred on high-income Western countries where strong reform interventions have profoundly changed the landscape of retirement (Henkens et al., 2018), more research is needed to provide evidence from non-Western settings. In some developing countries, inadequate retirement welfare and remarkable demographic transitions are de-institutionalising and individualising retirement, turning it into an “incompletion institution” (Moen & Altobelli, 2006) full of uncertainties.

Life course theory posits that individual lives are shaped by a sequence of life statuses and roles embedded in historical and social changes (Elder, 1998; Elder et al., 2003). Late-career (dis)advantages, as argued by DiPrete and Eirich (2006), are accumulated over the whole course of one’s life. By focusing on earlier life experiences, key socio-economic factors that significantly differentiate late-career behaviours could be identified. This approach offers a more holistic understanding of the economic lives of older workers within a systematically stratified context. The retirement literature has maintained a primary interest in inspecting various proximate individual determinants of retirement and post-retirement employment (S. E. Sullivan & Al Ariss, 2019; M. Wang & Huang, 2024) and rarely explored the roles of life histories (Damman, 2017). Although some researchers have emphasised that retirement and late-career experiences are influenced and stratified by prominent social and economic factors such as education, income, or occupational class (Calvo et al., 2018; Radl, 2013), a comprehensive analysis of social stratification across life stages is still lacking. Moreover, the process of social mobility receives much less attention in retirement research. Among a few exceptions, researchers suggest that upward mobility is associated with retirement timing (Han & Moen, 1999) and reduced financial worries in retirement (Damman et al., 2015). More research is needed to examine the roles of socio-economic attainments and mobility over the life course in shaping late careers, especially in emerging economies like China, where social mobility rates are comparatively high (Xie et al., 2022; X. Zhou & Xie, 2019).

This study aims to investigate the influences of lifetime socio-economic dynamics on late-life employment from a long-term perspective. The first objective is to examine the relationships between socio-economic status [SES] and late-career behaviours among

older Chinese adults. Drawing on a social stratification perspective (Wright, 2015), this study enriches the current understanding of late working life by showing that socio-economic advantages in early and late adulthood can benefit retirement preparation and reduce the likelihood of employment among older people. Second, it will examine how socio-economic trajectories from childhood to mid-later adulthood may affect late-career behaviours. Life trajectories of socio-economic status could not only reveal the timing and direction of social mobility in older cohorts but also reflect past social changes in China. Advantaged trajectories, including upward mobility and stably high status, are expected to reduce the likelihood of late-life employment. Third, the interplay between lifetime socio-economic dynamics and the pension system in shaping late careers in urban China will be examined. From a welfare modification perspective, social welfare policies may either exacerbate or reduce the effects of socio-economic differences (Dannefer, 2020). This study contributes to the retirement literature by pinpointing that pension eligibility may augment the differentiation in late career pathways between advantaged and disadvantaged older adults. To explain socio-economic inequalities in retirement, it will also illuminate the importance of financial necessity by taking into consideration pension income gaps, access to welfare rights, and family financial needs.

This study takes place in urban China. The culture of working longer, albeit without intensive retirement reform interventions, prevails in developing regions, such as Southeast Asia and China (O’Keefe et al., 2021). In 2023, the number of Chinese pensioners reached 314.6 million (National Bureau of Statistics of China, 2024), raising a tremendous financial challenge for pension funds. The age structure of China’s workforce is evolving dramatically, with mature workers aged 50 or older accounting for more than 36.3%. Yet, research reports that resource-poor older people, such as rural migrants and low-status residents, are over-represented in China’s ageing workforce (K. Feng, 2023; Giles et al., 2023; O’Keefe et al., 2021). This speaks to the need to briefly introduce social changes and retirement policies in China that influence late-career behaviours. During the socialist period from 1957 to 1977, China established and developed a planned economy in which jobs were allocated by the state through administrative procedures. Workers

in governmental agencies, public institutions, and state-owned firms (traditionally called *danwei*) held stable and life-long jobs, known as “iron rice bowls”, that provided various job-based resources (Bian, 2002; X. Wu, 2019). The household registration system (*hukou*) in China restricted geographic mobility for decades, creating a dual labour market where non-agricultural sectors were located mainly in urban areas. Since 1978, the market transition and industrialisation spurred massive waves of rural-urban migration in China. Because of the *hukou* system, urban residents were endowed with access to *hukou*-based welfare rights, such as housing, education, and pensions for urban employees, that were unavailable to rural-origin migrants (Fan, 2002; X. Wu & Treiman, 2007). Meanwhile, educational reforms and urbanisation have substantially boosted economic growth in urban regions, unleashing enormous opportunities for socio-economic mobility. Public pension policies in China are stratified by occupation/*danwei* and gender and provide incentives for urban *danwei* workers to retire early (for example, the minimum age of disability retirement for blue-collar women workers was 45 before 2025). Workers without a *danwei*-based pension programme commonly participate in resident social pension plans that offer lower-level pension benefits (Zhu & Walker, 2018). To proactively facilitate high-quality population development and improve pension sustainability, the Chinese government announced a formal plan for delaying retirement ages in the following 15 years from 2025 to 2040: the statutory retirement ages of women cadres and men will be gradually increased by three years to 58 and 63, while that of blue-collar women workers will be raised to 55, up from 50. Because China’s urban labour market is highly segmented, lower-status older workers may have difficulty acquiring high-paying positions, building up their retirement savings, and accessing decent pension benefits. Therefore, evaluating social and economic inequalities in late working life and retirement security will advance the understanding of retirement and late careers and inform future policies that delay retirements and minimise inequalities in the ageing workforce.

2.2 Theoretical Framework

The study of lifetime inequalities in retirement represents an emerging scholarly terrain that connects two complementary lines of theoretical discussions, namely (1) the life course theory and (2) social stratification and mobility. By conceptualising lifespan human development as a set of social and economic trajectories from early life to later adulthood, the life course theory highlights that dynamic interactions between institutional constraints, such as social policies and labour markets, and individual agency shape the timing and experience of age-graded transitions (Dannefer, 2020; Elder, 1998; Elder et al., 2003). Retirement, as a later-life decision, reflects the long-term imprints of past lives. On the one side, Ekerdt (2004) argues that younger people are often instructed to anticipate their future careers and proactively prepare for their distant retirement. On the other side, divergent trajectories of life experiences and exposures can augment variability in retirement timing and retirement security (Brydsten et al., 2025; Crystal et al., 2017; Henretta, 1992, 2017). These arguments suggest that the temporal dynamics of retirement require a deeper look into the historical, social, and biographic contexts that shape retirement planning, retirement timing, and post-retirement behaviours (Han & Moen, 1999).

Theories of social stratification and mobility have been developed to illuminate how later-life inequalities are shaped over the life course. Socio-economic advantages and disadvantages can be re-produced and accumulated over time (DiPrete & Eirich, 2006; Merton, 1988) and across generations (Blau & Duncan, 1978; Grusky, 2001; Hout, 2015; Sewell et al., 2003; Wright, 2015). It implies that the dynamics of socio-economic attainment and mobility can exert an influence on employment-related opportunities and constraints in the labour market. Accordingly, it is important to ascertain how socio-economic (dis)advantages throughout the life course affect employment decisions in later adulthood. By drawing insights from these two theoretical perspectives, this study proposes a comprehensive framework to examine how socio-economic status over the life course may influence late-career behaviours in older Chinese adults. The framework integrates three key dimensions of the life-course socio-economic process, inducing (1) social

stratification, (2) status mobility, and (3) welfare modification, to understand late-life employment.

2.2.1 Social Stratification in Late Career Behaviours

Following the Weberian tradition, contemporary class theorists have defined social class as material life conditions generated from certain individual resources and rights (Sorenson, 2000). The uneven allocation of socio-economic resources, through social forces and/or individual efforts, sets the context in which people are placed at different class destinations. Individuals from advantaged class backgrounds are more likely to achieve a higher social status and consequently have better economic well-being (Wright, 2015). In the labour market, the process of social stratification can significantly affect a wide range of employment outcomes, such as occupational attainment in early careers (Manzoni et al., 2014; Passaretta et al., 2018), subsequent career progression and trajectories (Härkönen & Bihagen, 2011), as well as income (X. Zhou & Wodtke, 2019).

This structural perspective could be extended to late careers by linking social class to the inequality in retirement timing (Radl, 2013; Visser et al., 2016). Because retirement is a decision-making process that involves careful calculations of potential benefits and costs of labour force withdrawal (Feldman, 1994; Laitner & Sonnega, 2013; Szinovacz, 2003), an older worker may rationally choose to terminate the working life when greater benefits could be secured through retirement. Although it is widely assumed that retirement programmes provide retirees with a pension income for maintaining living standards, older workers trapped in life-course disadvantages may find retirement unaffordable and, therefore, extend their working life (Visser et al., 2016). With increasing de-standardisation and individualisation of retirement, the influence of social stratification on the degree of choices regarding retirement transitions as well as post-retirement economic well-being can become more prominent.

Socio-economic resources that characterise social class positions are not fixed and evolve over the life course. The traditional status attainment model shows that family backgrounds, or childhood socio-economic conditions, have a long-lasting effect on labour

market outcomes (Hout, 2015). This process is mostly driven by parents' investment in their children's human capital, such as education, in early life (Blau & Duncan, 1978; Sewell et al., 2003). Nonetheless, debates around ascriptive status may overlook status attainments in adulthood that more profoundly and proximally influence labour market behaviours. Following previous literature (H. Liu & Guo, 2015; Mayer, 2009), this study conceptualises lifetime socio-economic status as a multidimensional index of material life conditions at three key life stages, namely childhood, young adulthood, and mid-later life.

From a life course perspective, childhood life conditions may affect older workers' decision to retire when approaching retirement. Early life socio-economic conditions can not only foster the development of expectations and aspirations for career and occupation (Whiston & Keller, 2004) but also influence access to resources in adult life. Several studies have shown that socio-economic disadvantages in childhood have a long-term effect on late careers, leading to an increased risk of health decline, early workforce exit, and disability retirement (Fahy et al., 2017; Harkonmaki et al., 2007; Laditka & Laditka, 2019). Compared to those with disadvantaged backgrounds, ageing workers from advantaged families tend to achieve higher occupational status and earn more income (Ballarino et al., 2021; Giangregorio, 2023), implying a better retirement preparation. Parental employment disadvantages, such as unemployment or low-wage jobs, can increase the risk of joblessness later in life (Brydsten & Baranowska-Rataj, 2022). Given limited evidence from non-Western countries, it remains unclear whether and how family backgrounds affect late-life employment in China.

Throughout adulthood, the labour market may enlarge socio-economic differences between workers, producing uneven experiences during retirement transitions. Here, it is necessary to differentiate SES in early and late careers. Educational attainment and occupational choices in the early work course can influence retirement decisions by demarcating career paths (Henretta, 2017). Evidence shows that education is positively associated with early labour force withdrawal among older workers in developing regions, such as India (Chattopadhyay et al., 2022), Southeast Asia (Kikkawa & Gaspar, 2023),

and China (Giles et al., 2011), because well-educated adults can access high-quality jobs and craft their career development. Over the past few decades, China's occupationally stratified retirement policies favoured early or on-time retirement among older workers in stable, skilled employment. In contrast, low-skilled workers have greater difficulty accessing formal employment and are more likely to work longer due to limited pension income (K. Feng, 2023). Moreover, in later life, socio-economic resources constitute the proximate resource opportunity for older workers when planning for retirement. Research has shown that pre-retirement material and financial assets may be negatively associated with older Chinese workers' willingness to work longer (Ling & Chi, 2008). Older adults with poor financial resources usually develop worries about their retirement security, thereby seeking new employment opportunities to ensure economic independence (Bai, 2019). Hence, I hypothesise that older workers with higher lifetime SES scores may be less likely to engage in late-life employment in urban China.

Hypothesis 1: *Lifetime SES scores are negatively associated with late-life employment.*

2.2.2 Social Mobility Perspective: Divergent Trajectories and Unequal Retirement

Research on social mobility focuses on the opportunities and directions of mobility between class positions. Unlike social stratification underlining class differences, social mobility is a core indicator of social closure or openness in a given society: restricted or declined mobility stabilises class positions and increases inter-group conflicts, whereas high mobility rates signify flexible group boundaries and rich economic opportunities (Grusky, 2001; Weber, 1978). In sociology, social mobility researchers have long debated whether class effects can persist over time (Hout & DiPrete, 2006). Notably, growing concerns have arisen regarding enduring roles of social class and declined rates of social mobility in many Western societies because of strengthened associations between class origins and destinations, namely intergenerational persistence (Hout, 2018). Recent studies from the United States, for example, have suggested that the consolidation of class

advantages and disadvantages could emerge in both economic and non-economic arenas (Maralani & Portier, 2021; Wilmers & Aepli, 2021). However, in developing countries like Brazil and China, a higher (or increasing) rate of social mobility is often reported by empirical studies (Torche & Ribeiro, 2010; Xie et al., 2022; X. Zhou & Xie, 2019). These cases demonstrate a pattern that the roles of family backgrounds in status attainment have been weakened by major social and economic changes including urbanisation, industrialisation, rural-urban migration, as well as educational expansion. In this study, it is suggested to identify the extent and influences of social mobility in older Chinese people.

Traditionally, social mobility is captured by comparing class positions between either two points of time or two generations and is mostly examined within a single dimension (such as occupational mobility). From a life course perspective, social mobility unfolds through a sequence of status transitions and should be better understood as trajectories that reflect both intergenerational and intragenerational changes in various life domains. By focusing on socio-economic positions from childhood to mid-later life, this study will further uncover social mobility trajectories over the life course. Four typical social mobility patterns, or socio-economic trajectories, have been frequently discussed in the literature (Islam & Jaffee, 2024; H. Liu & Guo, 2015). First, a stably high-status group is comprised of privileged individuals who persistently occupy a higher stock of socio-economic resources. It signals a consolidation process of elite status where a higher parental social class can be translated into a greater level of educational attainment, a higher occupational status, and more wealth (Hansen & Toft, 2021; Hout, 2015). Second, upward mobility refers to the process in which individuals gain a social standing higher than their initial positions. This is a trajectory commonly favoured by scholars as well as the general public. Studies have found that educational expansion and rapid industrialisation in post-reform China eroded intergenerational status persistence and created numerous opportunities for Chinese adults to move upward (Bian, 2002; Xie et al., 2022; X. Zhou & Xie, 2019). In this sense, upward mobility implies that adulthood social mobility offsets the negative effects of disadvantaged family origins, improving career prospects

and economic preparations for retirement. Third, downward mobility includes a group of people who have experienced status losses or adverse life events. For them, the failure of class re-production can increase life course risks (such as temporary employment and low pay) (Pintelon et al., 2013) and cause enduring psychological stress (Islam & Jaffee, 2024). Fourth, people staying in the lower strata are the most disadvantaged in terms of social mobility because unfavourable life conditions remain unchanged. With inadequate resources, this low-status group may face more financial needs that necessitate a longer working life. For example, many immobile older residents in rural China have to work as long as they can (de Brauw & Rozelle, 2004). In urban China, the accumulation of disadvantages can also affect retirement because disadvantaged and low-skilled workers, including rural-origin migrants, are found to be forced to work longer due to precarious employment and financial restrictions (Giles et al., 2023; Q. Zhang & Wu, 2023). Hence, I expect that older adults from upward mobility and stably high-status trajectories may have lower odds of workforce participation later in life compared to those with a stably low status. Although people from the downward mobility trajectory are ranked higher than the stably low-status group in terms of childhood socio-economic positions, the two groups may gradually converge in later adulthood.

Hypothesis 2: *Upward mobility and stably high SES status are negatively associated with late-life employment compared to stably low status (2a), while downward mobility is not associated with late-life employment (2b).*

2.2.3 Welfare Modification Perspective: The Role of Pension Eligibility

The welfare modification perspective proposes that socio-economic inequalities can be modified by macro-level factors such as social policies and welfare states (Dannefer, 2020; Hout & DiPrete, 2006; O’Rand, 1996). Social policies and services are developed to promote equality and justice at the societal level. The welfare modification hypothesis has received much support in research on socio-economic disadvantages and health. For example, evidence has shown that social policies that provide high-quality healthcare

services (Andersson et al., 2023) and more generous social investment (Parbst & Wheaton, 2023) can alleviate health disparities. Comparative studies of retirement have suggested that social stratification may have stronger influences on the differentiation of late-career decisions in countries where retirement protections are under-developed (Turek et al., 2024).

This study focuses particularly on the role of pension in the associations between lifetime socio-economic dynamics and late-life employment. Because pension eligibility serves as a strong policy incentive for older workers to transition from employment to retirement, it may either alleviate or enlarge socio-economic inequalities (Dannefer, 2020). In China, older adults are less likely to participate in economic activities after receiving a pension income (K. Feng, 2023; Giles et al., 2023) due to the long-standing mandatory retirement policies. Because most pension schemes require long-term continuous pension contributions, career interruptions such as unemployment can increase the risk of losing acquired welfare rights. Besides, lower-status and low-skill workers often experience more employment discrimination, which can restrict their upward mobility opportunities and hinder the accumulation of wealth and pension benefits (Visser et al., 2016). In consequence, pension eligibility may exaggerate social inequalities in later careers if a secure safety net for the low end of social class is underdeveloped. Here, I anticipate that the associations of lifetime SES scores with late-life employment may be more prominent after reaching pensionable ages. That is, older adults with higher status may be less likely to extend their working lives beyond pension ages because pension eligibility offers them greater retirement security. Similarly, pension eligibility can significantly increase the retirement rates of older adults who have experienced upward mobility or stayed at high status. Given the life-course consolidation of advantages, the reduction in employment rates would be greater in the immobile and stably high-status trajectory compared to upward mobility.

Hypothesis 3: *The effects of lifetime socio-economic scores and trajectories on late-life employment are more salient after pensionable ages.*

2.2.4 Financial Necessity of Longer Working Lives

The above discussions concerning socio-economic inequalities in retirement rest on an economic presupposition that employment behaviours are mainly driven by financial needs. Motivations behind late-life employment usually vary by social class and welfare context. Much of the retirement literature is based on high-income Western countries where the multi-pillar system of retirement protections is well-developed and policies that raise retirement ages and encourage extended working lives have been implemented for years or a few decades. Evidence has shown that, in advanced welfare regimes, socio-economic resources are positively or not associated with retirement timing and post-retirement employment. In Western and Northern Europe, older people with higher social class were more likely to delay retirement and engage in post-retirement employment (Leinonen et al., 2020; Radl, 2013). Although older European workers with limited socio-economic resources are more likely to claim social security benefits early (Wahrendorf et al., 2012) and develop negative emotional reactions toward retirement age reforms (van Solinge & Henkens, 2017), their post-retirement employment rates have increased significantly by virtue of policy interventions. Because all social groups show a high tendency to delay retirement, Cahill et al. (2017) argue that financial necessity is no longer a key driver for bridge employment in the United States.

In developing countries, a disproportionate share of older workers are subject to a higher risk of retirement insecurity because public pension systems are less developed and tend to prioritise employees from the public sector and high-level occupations. As workers age, advantaged workers with more resources are eligible for considerable retirement incentives and may opt to retire early or on time. Low-status workers who remain in vulnerable employment circumstances and frequently struggle with financial needs (Q. Zhang & Wu, 2023) cannot fully count on public and informal transfers to fulfil consumption goals. Their motivations for employment, somewhat akin to disadvantaged workers from high-income countries (Cahill et al., 2017; Visser et al., 2016), are primarily extrinsic.

Rather than viewing China and Western countries as contradictory cases, this study

argues that the differences reflect varying degrees of societal transition from early- to late-exit arrangements (Jensen, 2024). The unprecedented rates of economic growth and demographic ageing in China indicate that traditional retirement norms are being eroded by older people seeking independence and security through continued workforce participation. The present study considers financial necessity a core mechanism underlying unequal late-career behaviours in China. In the context of retirement reforms, non-economic factors will gradually gain prominence in the ageing workforce as shown in Europe and Northern America.

Based on previous research (Bai, 2019; Giles et al., 2023; Q. Zhang & Wu, 2023), I expected that the class effects on late-life employment could be explained by financial needs due to a low pension income, limited welfare rights, and intergenerational transfers. Because retirement decisions are made in later adulthood, proximate socio-economic resources may more strongly affect financial preparations for retirement than distant family backgrounds. From a social mobility perspective, I expect upward mobility and stably high status to be associated with a higher pension income, leading to lower odds of late-life employment.

Hypothesis 4: *Lifetime socio-economic scores are positively associated with pension income (4a); Upward mobility and stably high status are associated with higher pension income compared to stably low status and downward mobility trajectories (4b).*

To identify the heterogeneity in economic motivations, I will further explore whether the effects of lifetime socio-economic status on late-life employment differ between resident groups and change with family duties. According to hukou, researchers often categorise urban Chinese residents into three groups: (1) non-migrants; (2) permanent migrants, who have achieved an urban hukou status; and temporary migrants (Fan, 2002). Temporary rural-urban migrants are the most disadvantaged group in the labour market compared to urban residents (X. Wu & Zheng, 2018; Z. Zhang & Wu, 2017). If economic motivations operate as a key mechanism in retirement, temporary rural-urban migrants may be more sensitive to socio-economic resources in adulthood and maintain a higher likelihood of late-life employment than permanent migrants and urban natives. More-

over, employment can be a response to family-related financial needs, especially when public retirement protections are minimal or absent. Previous evidence shows that older Chinese parents strategically provide financial support to children in need (Zhu, 2016). Therefore, this study anticipates that older adults who face more financial needs (i.e., low-status temporary migrants and financial care providers) would be more likely to work, especially after pensionable ages.

Hypothesis 5: *Older Chinese adults with more financial needs have higher odds of late-life employment.*

2.3 Methods

2.3.1 Data and Participants

This study utilised data from the China Health and Retirement Longitudinal Study (CHARLS). The CHARLS is a nationwide representative longitudinal survey of Chinese adults aged 45 or older and their spouses (Zhao et al., 2014). The CHARLS is modelled as a companion study of several international ageing studies, namely the US Health and Retirement Study (HRS), the English Longitudinal Study of Ageing (ELSA), and the Survey of Health, Ageing and Retirement in Europe (SHARE). It conducted the baseline survey in 2011–2012 and four nationwide follow-up surveys in 2013, 2015, 2018, and, most recently, 2020. Based on a stratified list of county-level units from 28 provinces, the baseline survey selected 150 county-level units through systematic sampling. Using a probability proportionate to size sampling strategy, three rural villages or urban communities were chosen from each county-level unit. Face-to-face interviews were conducted with eligible participants from more than 10,000 households, with a response rate of 80.5% at the household level (Zhao et al., 2014). The baseline sample included 17,708 respondents, 40.5% of whom were urban residents. In follow-up waves, the panel response rates of the baseline urban sample declined slightly but remained higher than 75% (Zhao et al., 2023).

I used data from five waves of CHARLS’s prospective surveys (2011–2020) and re-

trieved additional information on the respondents' parents and childhood socio-economic conditions from the life history survey conducted in 2014. The study sample was comprised of older Chinese adults, who were aged 50 to 74 at baseline, participated in the life history survey, and resided in urban areas. This age group was selected because 50 was the minimum statutory retirement age for women workers in China and could represent the transition into late careers. Among the 3,730 urban adults, I excluded respondents who were not born in China's mainland or did not report their place of birth ($n = 31$) and never worked ($n = 115$) at baseline. Participants with missing data on life-course socio-economic indicators and baseline employment and pension status were excluded ($n = 209$). The final sample included 3,375 ageing Chinese adults. The average number of observations for each participant was 4.47 ($N_{\text{observations}} = 15,074$), indicating a relatively high retention rate.

2.3.2 Measures

Late-Life Employment

The dependent variable late-life employment was derived from the labour force participation status in each regular wave. The respondents were asked whether they engaged in non-agricultural employment, non-agricultural self-employment/family business, agricultural employment, and self-employed agricultural activities. The variable was coded as 1 if the respondents were currently working and 0 if they had formally retired, were unemployed, or exited the labour force. Because only a very tiny proportion of participants reported unemployment ($n = 76$), non-working respondents were deemed to be in actual retirement.

Lifetime Socio-economic Status

SES is a multidimensional construct that involves various socio-economic conditions and differs by life stages. In this study, I measured SES in childhood, young adulthood, and mid-later years (H. Liu & Guo, 2015). Childhood socio-economic conditions represent social and economic resources accumulated at the family level and are typically indexed

by parents' employment and education (Hayward & Gorman, 2004; H. Liu & Guo, 2015). To construct childhood SES, I relied on details about parental education and occupation. Parents' highest education was coded into two ordinal variables (1 = "no formal education", 2 = "did not finish primary school but capable for reading or writing/sishu/home school", 3 = "primary school", 4 = "middle school", 5 = "high school/vocational school", 6 = "two- or three-year college", and 7 = "university or above"). In the CHARLS life history survey, respondents reported their parents' employment status (working all of childhood, part of childhood, or not working) and occupation (farming or non-agricultural work) before age 17. Paternal occupation was coded into three ordinal levels, including 1 = absent or not working, 2 = agricultural self-employment, and 3 = non-agricultural employment. Given a relatively small share of respondents had a father who worked part of their childhood ($n = 74$, 2.32%), these fathers were deemed as workers. Maternal occupation status was not used here because the gendered division of labour may discourage mothers' employment in traditional Chinese families ($n = 496$, 15.12% were not working). Additional analysis showed that paternal education and urban residence in childhood were negatively associated with mothers' workforce participation.

Young adulthood SES was measured by educational level (from 1 = illiterate to 7 = university) and initial occupation. For the first job, the type of occupation (*danwei*) was grouped and ranked as follows: (1) farmer (agricultural self-employed/or worked for rural collectives); (2) non-firm employee (individual household/NGO/other); (3) firm or individual firm employee; and (4) public sector (government or public institution) employee. In China, farmers have the lowest social position, whereas employees in the public sector have access to many special welfare rights and high social prestige. Education and initial occupation can capture socio-economic position during the early work course.

I measured mid-later life SES by asset index and household consumption. Previous literature suggests that the ownership of household durable goods is a widely used measure of SES or wealth (Filmer & Pritchett, 2001; Vyas & Kumaranayake, 2006). Six key durable goods, including a refrigerator, a washing machine, a television, a computer, an air conditioner, and a mobile phone, were selected to construct a summary asset index

(from 0 to 6). In addition, I also used per capita household consumption instead of household income or wealth as did in previous studies (H. Liu & Guo, 2015) because it had more valid information and could reflect the standard of living more comprehensively. The total annual household consumption was calculated based on food expenditures, non-food expenses (e.g., communication), and other expenditures like travelling and durable goods. Medical expenses during the past year were not included to avoid bias concerning catastrophic health expenditures. Household consumption was further adjusted by dividing the number of household members. As the distribution of household per capita consumption was skewed, I obtained quintiles to index the relative level of financial standing (from 1 = lowest 20% to 5 = highest 20%).

Pension Eligibility

Pension eligibility status was a binary variable indicating whether the respondents had already received a pension income (pensioner versus non-pensioner). China's retirement protection system is comprised of multiple pension schemes, namely (1) the urban employee basic pension programme, which encompasses the pension programme for government and public institution employees (GIP) and the urban enterprise basic pension (EEBP), (2) the resident social pension (RSP), and (3) other pension programmes (such as a commercial pension plan). The employment-based and resident pension schemes are mandatory public programmes but the latter offers much less pension benefits (Zhu & Walker, 2018). Retirees are eligible for monthly pension benefits after they have processed formal retirement procedures or submitted a pension claim to the local social insurance authority. For pensioners, the amount of monthly pension income was recorded.

Family and Health Conditions

In this study, I accounted for a set of potential factors that affect retirement or late-life employment (Damman, 2017; Fisher et al., 2016; Giles et al., 2023). Specifically, household registration (*hukou*) type (agricultural versus non-agricultural), baseline residential area (town versus city), and physical health were considered as family and health path-

way variables that may explain the relationships between SES and late-life employment. Non-agricultural hukou, as a kind of urban citizenship status, is associated with access to public services and welfare rights in the locality (Fan, 2002). Health was measured by the limitation in six basic activities of daily living (ADL, such as dressing) and the number of chronic illnesses (none, one, two, three or more). Given the sample's age structure, adjusting for these factors could enable researchers to estimate the effects of SES on employment in late adulthood, net of household and health conditions. In additional analysis, the respondents were categorised into three resident groups: urban natives, permanent migrants, and temporary migrants. Other family-related factors, including family structures (i.e., parental survival status, number of children, and intergenerational co-residence) and caregiving duties (i.e., childcare involvement and financial transfer), were only included in additional analyses because of their weak associations with employment.

Demographics and Contextual Factors

The information on respondents' age, sex, ethnicity (Han versus minority), and marital status (unmarried versus married/cohabited), was included. I also controlled the area of birthplace (rural versus urban) and geographic region (eastern, central, western, or northeastern China) that may affect lifetime SES and employment behaviours. The area of birthplace was measured by asking the respondents where they mainly lived before 16. I did not include childhood health and self-rated childhood family's financial status because these variables were not associated with late-life employment in additional analyses and had ambiguous relationships with childhood SES.

2.3.3 Data Analysis

I first performed three principal component analyses [PCA] to obtain composite SES scores at different life stages (Descriptive statistics of the SES indicators are presented in Table S2.1). Because all the SES indicators were treated as ordinal variables, polychoric PCA was employed following the procedure of Kolenikov and Angeles (2009). Compared to traditional PCA used by Filmer and Pritchett (2001), polychoric PCA is more effec-

tive in identifying latent components of ordinal indicators and has demonstrated greater robustness (Poirier et al., 2020). The *polychoric* package in Stata was used to estimate eigenvectors and eigenvalues from polychoric correlations. In each principal component analysis, only the first principal component had an eigenvalue larger than 1. The three predicted principal component scores were standardised and had generally normal distributions, with a high value indicating a better socio-economic position. As shown in Table S2.2, the first component of polychoric PCA explained a greater proportion of variances in SES indicators, ranging from 61.1% to 79.1%, than that of traditional PCA.

Based on lifetime SES scores, I further employed k-means analysis to construct the trajectories of SES that could reflect longitudinal changes in SES from childhood to mid-later adulthood and unveil the differences between disadvantaged and advantaged groups. The scores of SES obtained from polychoric PCA analyses were transformed into percentiles from 1 to 100 to ensure comparability. The k-means analysis iteratively assigns the respondents to the nearest cluster centroid according to the sum of the Euclidean distance (Everitt et al., 2011). The optimal solution, or the number of centroids, was determined by the elbow method (Makles, 2012) and the Calinski–Harabasz pseudo-F (CH) index. Figure S2.1 plotted the within sum of squares (WSS) across 2 to 10 clusters. The four-cluster solution appeared to be optimal because the graphs showed an elbow in WSS and logged WSS as well as an increase in proportional reduction of error at $k = 4$. The CH value was the highest for four trajectories ($CH = 2099.86$) than the other solutions, except for two groups ($CH = 2287.51$).

I described the characteristics of the sample and tested group differences between working and non-working respondents. Multilevel logistic regression models were conducted to examine the associations between lifetime socio-economic status (SES scores and social mobility trajectories) and late-life employment outcomes, given a highly nested structure of the data. I performed regression analyses using two-level random-intercept models, with time-varying factors at level 1 and person-level time-constant factors at level 2. I first estimated the effects of lifetime SES in two separate models for SES scores and trajectories while controlling for demographic and contextual factors. Household

and health conditions were then included in the fully adjusted models (extended models). To explore the roles of pension eligibility in the associations between lifetime SES and late-life employment, I performed regression analysis in sub-samples stratified by pension eligibility status. Because the regional labour market and public infrastructure may influence retirement decisions (Szinovacz, 2003), I clustered standard errors at the city level to allow within-city similarity in employment behaviours. Odds ratios (OR) and robust standard errors (SE) were reported to assess the effect sizes.

The mechanisms underlying the SES-employment link were examined in three ways. First, I applied quantile regression analysis to examine how lifetime socio-economic dynamics were associated with monthly pension income. Second, I investigated the heterogeneous effect of lifetime SES on late-life employment in different resident groups. Based on original and current hukou, I categorised the participants into three groups (Fan, 2002; X. Wu & Zheng, 2018): (1) temporary rural-urban migrants (holding an agricultural hukou but living in urban areas); (2) permanent rural-urban migrants (obtaining a non-agricultural hukou); and (3) urban natives (holding a non-agricultural hukou consistently). Third, I examined the relationships between lifetime SES and caregiving duties, which encompassed childcare involvement, upward transfer, and downward transfer, while adjusting for family structures.

To check the robustness of my results, I examined whether the relationships between lifetime socio-economic dynamics and late-life employment were non-linear and differed by age and sex. Because people over 60 are commonly entitled to a pension income, the interactions between lifetime SES scores and mean-centred age, an objective proxy of pension eligibility, were expected to be negatively associated with late-life employment. Regarding sex differences, I performed stratified analyses to explore how the socio-economic gradients in employment might change during retirement transitions among women and men. Moreover, I also carried out additional analyses to examine the relationships between individual SES indicators and late-life employment.

2.4 Results

2.4.1 Descriptive Results

Table 2.1 presents the descriptive information on the pooled sample. The participants had a mean age of 64.47 years ($SD = 7.03$) and 49.01% of males. A vast majority of the respondents were Han Chinese (93.91%), married (85.46%), and ever lived in rural areas during childhood (77.11%). In this urban sample, 47.83% of the respondents held a non-agricultural hukou, suggesting that over half were temporary rural-urban migrants who reported an agricultural hukou status. As for current residences, 41.64% were residing in cities, while the remaining respondents lived in towns. Regarding health, only 17.59% of the respondents had ADL-related disability and a vast majority had at least one chronic illness (78.25%).

[Inset Table 2.1 here]

In the sample, 54.08% of the respondents were working and 75.89% received a pension income. The stratified sample shows that younger respondents and those born in rural areas as well as Eastern China reported a higher prevalence of workforce participation. Late-life employment did not differ by ethnicity. In the family context, older adults who were married, held an agricultural hukou, and dwelled in small towns showed higher employment rates. Furthermore, working respondents reported better physical health than participants out of the labour force. The percentage of respondents with ADL-related disability was 13.16% in the older worker groups compared to 21.35% in non-workers. Similarly, older workers had a lower percentage of individuals having two or more chronic illnesses.

The table also shows that working respondents had lower lifetime SES scores than non-workers, indicating that resourceful older people may be more likely to exit from the workforce or retire in urban China. The final four-group solution of k-means clustering analysis produced a meaningful set of socio-economic mobility trajectories over the life course (Figure 2.1). The first trajectory was named as “stably low” ($n = 864$, 25.60%). Although this group experienced appreciable increases in SES, its members remained at

the lowest SES quartile throughout their life course. The second group was comprised of respondents who experienced “downward mobility” ($n = 827$, 24.50%). It also shows that downward mobility typically started from the early work course. The third trajectory was termed “upward mobility” ($n = 639$, 18.93%) because its members moved from a low SES position to a moderately higher position in their adulthood. The last trajectory consisted of advantaged respondents who remained at “stably high” ($n = 1045$, 30.96%) socio-economic positions in their whole life. According to Table 2.1, working respondents had larger proportions of individuals from the stably low (31.44%) and downward-mobility trajectories (30.21%) than non-workers.

[Inset Figure 2.1 about here]

Figure 2.2 presents the employment rates of older Chinese adults in different SES quartiles and trajectories. Before reaching pensionable ages, older adults with larger SES scores had higher employment rates. Meanwhile, upward mobility and stably high SES trajectories also had higher employment rates than the remaining two trajectories. The figures further reveal a consistent pattern that older Chinese adults substantially reduced their employment rates after reaching full pension ages. The reduction in employment rates after receiving a pension income was more prominent among respondents with a higher SES score and from the stably high-status group.

[Inset Figure 2.2 about here]

2.4.2 Effects of Lifetime Socio-economic Status on Late-Life Employment

I estimated the associations between lifetime socio-economic dynamics and late-life employment using multilevel logistic regression. The results of regression analysis are shown in Table 2.2. In Model 1, I included three lifetime SES scores while adjusting for all demographic control variables. Model 3 estimates the effects of social mobility trajectories on late-life employment. Because these two models do not include contemporary household and health variables, it remains unclear to what extent socio-economic gradients in late-life employment can be observed net of other intervening factors. Therefore, the

current hukou type, residential area, and physical health were adjusted in Models 2 and 3.

[Inset Table 2.2 here]

Model 1 shows that childhood SES score was associated with higher odds of late-life employment ($OR = 1.176$, $SE = 0.076$). It indicates that older adults born in families with a higher SES were more likely to engage in economic activities later in life. In contrast, the young adulthood SES score had a negative coefficient ($OR = 0.594$, $SE = 0.044$), suggesting that young adulthood SES was related to a lower likelihood of late-life employment. A negative association between mid-later life SES and labour force participation was found in Model 1. The coefficient of mid-later life SES score ($OR = 0.637$, $SE = 0.046$) indicates that participants with a higher SES in mid-later adulthood were less likely to work. I also observed that the negative associations between adulthood SES scores and late-life employment were decreased but remained meaningful in Model 2. In addition, after accounting for current conditions, the positive association between childhood SES score and late-life employment was slightly strengthened. Hence, the inconsistent evidence implies that Hypothesis 1 may be only applicable to adulthood socio-economic conditions.

To further examine the effects of lifetime social mobility trajectories and late-life employment, I now turn to Models 3 and 4. Model 3 shows that both upward mobility ($OR = 0.291$, $SE = 0.060$) and stably high-status ($OR = 0.175$, $SE = 0.038$) trajectories were negatively associated with late-life employment. It could be interpreted that older adults who experienced upward mobility or remained in higher socio-economic positions had a reduction of 70.9% and 82.5% in the odds of late-life employment, respectively, compared to those with a stably low status. In Model 4, the negative effects of upward mobility and stably high SES groups on late-life employment were weakened but still noticeable in size, lending support to Hypothesis 2a. Compared to the stably low-status trajectory, the effect of downward mobility on late-life employment was not significant. This result supported Hypothesis 2b that the difference in the likelihood of late-life employment between stably low SES and downward-mobility groups may be minimal, probably because

of resource constraints later in life.

Table 2.2 reveals that late-life employment was associated with several demographic and childhood factors. Respondents who were older and born in urban areas were less likely to work in mid-later adulthood. Male and married respondents had a higher likelihood of late-life employment than their counterparts. Relative to participants born in rural areas, urban natives showed a lower probability of working. The household factors, namely holding a non-agricultural hukou and living in cities, were negatively associated with late-life employment. Poor physical health, indexed by ADL-related disability and two or more chronic illnesses, was negatively associated with late-life employment, suggesting that health limitations can reduce older adults' likelihood of workforce participation. Pension eligibility status had a consistently negative association with late-life employment. This is not surprising because pension income serves as an incentive for workers to retire from the labour force. The odds of employment among pensioners were about 44% lower than that of non-pensioners, regardless of health and household conditions.

2.4.3 Socio-economic Inequalities in Late-Life Employment during Retirement Transitions

In Table 2.3, I investigated whether the associations between lifetime socio-economic trajectories and late-life employment varied by pension eligibility status. Models 1 and 2 examined the effects of lifetime SES scores whereas the remaining two models were estimated for lifetime SES trajectories. For non-pensioners, I observed that only the SES score in mid-later life was negatively associated with late-life employment in Model 1 (OR = 0.829, SE = 0.076). The relationships between lifetime SES trajectories and late-life employment were not detected in Model 3.

[Inset Table 2.3 here]

Model 2 shows that childhood SES score was positively associated with employment after reaching pension eligibility ages (OR = 1.236, SE = 0.086). Furthermore, young adulthood SES (OR = 0.678, SE = 0.060) and mid-later life SES (OR = 0.722, SE =

0.048) were negatively associated with employment after pension eligibility ages. Model 4 shows that upward mobility ($OR = 0.403$, $SE = 0.083$) and stably high SES trajectory ($OR = 0.316$, $SE = 0.070$) were negatively associated with employment after pension eligibility ages. I tested the group differences using the margins from interaction analysis and presented the results in Figure 2.3. It shows that the reduction in employment rate before and after pension eligibility ages was negligible among respondents from the stably low trajectory. Nonetheless, significant reductions were found among respondents from the two advantaged trajectories, namely upward mobility and stably high-status groups. Hypothesis 3 regarding the roles pension eligibility was supported.

[Inset Figure 2.3 about here]

It is also interesting to note that non-agricultural hukou and two or more chronic conditions were mainly associated with employment after pension eligibility ages. Moreover, the positive effects of marital status and survey wave on late-life employment were mostly found after pension eligibility ages. These results suggest that the process of employment decision-making may change over late working careers and that older pensioners were more affected by socio-economic resources, hukou type, marriage, and chronic conditions.

In sum, the results showed that pension eligibility status accentuated the socio-economic disparities in retirement among urban Chinese residents. Before pension eligibility ages, urban Chinese adults with more socio-economic resources in mid-later life were more likely to withdraw from the workforce. After receiving pension incomes, childhood SES was associated with a higher likelihood of late-life employment. Moreover, older adults who had achieved a higher adulthood SES, either through upward mobility or advantage consolidation, were less likely to work beyond pensionable ages.

2.4.4 Financial Necessity Matters for Older Workers

To investigate the mechanisms linking SES and employment, I performed the following three sets of regression analyses to explore whether and how (1) pension income, (2) resident/hukou status, and family duties may drive differential late-career decisions among older adults.

Table 2.4 presents the results of the associations between lifetime SES and monthly pension income. I only included the 50th and 75th percentile of monthly pension income because they can reflect the median and high levels of retirement security. As for lifetime SES scores, it shows that childhood SES was only modestly associated with a higher median pension income while SES scores in adulthood, especially young adulthood, were associated with significantly higher monthly pension income at both 50th and 75th percentiles. Regarding SES trajectories, upward mobility and stably high-status trajectories were also positively associated with monthly pension income in median and 75th quantile regression analyses. In addition, it could also be observed that adulthood SES scores and SES trajectories had a stronger association with monthly pension income at the 75th percentile compared to the median pension income. Consistent with Hypotheses 4a and 4b, the results indicate that socio-economic status and privileged SES trajectories can provide older Chinese adults with better retirement protections, thereby reducing their need for a longer working life.

[Inset Table 2.4 here]

I further examined the associations between lifetime SES and late-life employment in different resident groups. Table 2.5 shows that childhood SES score was only positively associated with late-life employment among temporary rural-urban migrants, a marginalised group in urban China that may face considerable barriers to welfare and economic integration. Among temporary rural-urban migrants, adulthood SES scores were negatively associated with late-life employment. The results of permanent rural-urban migrants revealed a negative association between mid-later life SES and employment. Nonetheless, lifetime SES scores appeared to be of little importance for urban natives' employment decisions. In terms of lifetime SES trajectories, I found that temporary rural-urban migrants had lower odds of late-life employment if they experienced upward mobility. The stably high SES trajectory was associated with a lower likelihood of employment among permanent rural-urban migrants and urban natives, indicating that the acquisition of an urban hukou status can improve economic assimilation. To facilitate the understanding of differences in employment between resident groups, the predicted

probabilities of employment before and after pension eligibility ages were visualised in Figures S2.2 and S2.3. Temporary rural-urban migrants, especially those from the disadvantaged SES trajectories, had the highest probability of employment after pensionable ages than those with an urban hukou. Before pension eligibility ages, only temporary migrants with a stably low-status trajectory showed a higher employment probability.

[Inset Table 2.5 here]

The results of regression analysis of family caregiving duties were summarised in Table S2.3. Lifetime SES, either scores or trajectories, was not associated with childcare involvement. Lifetime SES scores, especially adulthood SES, were positively associated with the provision of economic support to older or younger generations. The stably high SES trajectory was positively associated with upward and downward transfer, but upward mobility was only associated with higher odds of downward transfer. Among all family structure and caregiving factors, only downward transfer was positively associated with late-life employment. The associations between lifetime SES scores as well as social mobility trajectories and late-life employment remained generally consistent with the results in Table 2.2. Figure S2.4 shows the adjusted predictions from the interaction term between downward transfer and lifetime socio-economic trajectories. The provision of downward transfer was associated with a higher probability of employment in all trajectories, but downward transfer had a higher impact on older adults from the stably low SES trajectory. Hence, the analyses of resident status and family care duties provided support to Hypothesis 5 that older adults with greater financial needs are more likely to work longer.

2.4.5 Robustness Checks

I checked the robustness of my results in several supplementary analyses. First, I stratified the sample by gender and pension eligibility and found that lifetime socio-economic dynamics may affect employment after pensionable ages in both sexes (Supplementary Table S2.4). But before pension eligibility ages, older men who experienced downward mobility may be more likely to work than those with a stably low status. Prior literature

has shown that some indicators of SES, such as education (Giles et al., 2011), may have a non-linear association with labour force participation. I then checked the nonlinearity in the relationships between lifetime SES and late-life employment in Supplementary Table S2.5 and results showed that only young adulthood SES had a U-shaped association with employment. Third, pension eligibility may be endogenous because older workers have growing autonomy in deciding when they will claim pension benefits. To address this concern, I replaced pension eligibility with the mean-centred age to examine whether the effects of lifetime SES on late-life employment changed with age (Supplementary Table S2.6). Given that the mean age of respondents was slightly above the highest full pension age (60) in China, using age as a proxy further confirmed the results in Table 2.2. Lastly, I examined the associations between individual SES indicators and late-life employment. The results showed that the education and non-agricultural employment (for older men) of fathers were associated with higher odds of late-life employment whereas the respondents' initial occupation status, household consumption, and asset index were negatively associated with late-life employment (Supplementary Table S2.7). The results of supplementary analyses generally support the main results and provide new insights into the socio-economic inequalities in late-life employment in urban China.

Meanwhile, I also observed the sex differences in late-life employment. Table S2.4 shows that, before pensionable ages, older women with higher SES in mid-later adulthood were less likely to work and older men who experienced downward mobility had higher odds of employment. After reaching pension eligibility ages, the effects of lifetime SES scores and social mobility trajectories on employment existed in both older men and women. Regarding individual SES indicators, Table S2.7 further shows that older men had 3.717 times higher odds of employment than older women, all else being equal. The results of stratified analyses indicate that older men with more adulthood socio-economic resources had lower odds of employment behaviours, while older women would be less likely to work when they had more economic resources in adulthood, except for education. Fathers' occupations could positively affect the odds of employment in older men but not in older women. These results indicate that older men of advantaged family origins

continued to work, probably because of adulthood financial strains caused by downward mobility.

2.5 Discussion

As the global ageing workforce grows dramatically, late careers become an extended phase of life where interrelated forces lead to rising individualisation of ageing-related transitions. Yet, the divergent destinies of older workers have not received much attention in scholarly and public debates. With a few notable exceptions, researchers have found that disadvantaged older workers are becoming an invisible social group vulnerable to heightened risks and uncertainties (Lain & Phillipson, 2019). This study sought to examine the life-course socio-economic dynamics of late-career behaviours among older adults in urban China by focusing on social stratification, social mobility, and welfare modification. To provide a comprehensive analysis of socio-economic inequalities in retirement, it innovatively incorporated lifetime SES scores at three life stages (in childhood, young adulthood, and mid-later life) and identified four socio-economic trajectories over the life course. The findings showed that adulthood socio-economic attainments were negatively associated with late-life employment. However, childhood SES had a negative association with late-life employment. Despite the inconsistency, this study revealed that older adults who experienced upward mobility or remained stably high status were less likely to work than their downwardly mobile and stably low-status counterparts. Moreover, the effects of lifetime socio-economic status on late-life employment were mainly observed after reaching pensionable ages and could be explained by differential financial needs. The findings of this study can raise public awareness of socio-economic inequalities over the whole working career, especially among older workers, in contexts of policy reforms promoting longer working lives.

2.5.1 Understanding Lifetime Socio-economic Dynamics in Late-Life Employment

The understanding of socio-economic inequalities in late-life employment should move beyond proximate life conditions by adopting a long-term perspective. The findings show that socio-economic exposures in childhood, young adulthood, and mid-later years are key factors for explaining late-career engagement in urban China. First, SES in young adulthood and mid-later life have a direct, negative relationship with late-life employment. This suggests that older adults who had more socio-economic resources in adulthood may be less likely to engage in the workforce in urban China, consistent with previous literature (K. Feng, 2023; Giles et al., 2023; Kikkawa & Gaspar, 2023; Ling & Chi, 2008). Young adulthood represents an early stage of career development in which younger workers strive to pursue challenge and advancement (North, 2024). A higher SES in young adulthood, indexed by education and initial occupation, may provide access to higher-quality jobs, improve income, and reduce employment-related risk (Pintelon et al., 2013). The educational and occupational differences could eventually increase the variability in retirement schedules (K. Feng, 2023), encouraging high-status workers to retire from the workforce early. Meanwhile, SES in mid-later life was also negatively associated with employment. Because mid-later life SES (i.e., consumption and the ownership of durable assets) reflects family living standards, advantaged older workers may develop a stronger sense of retirement security and be more likely to pursue leisure goals. Many older people with limited wealth and resources have to maintain independence by working longer because they know that relying on the government and children for financial support is unrealistic (Bai, 2019).

Second, I found that childhood SES score was negatively associated with late-life employment, even when adjusting for adulthood socio-economic conditions. This finding aligns with prior research showing that the direct effect of social origin on adulthood employment outcomes was independent of education and occupational status (Ballarino et al., 2021; Bernardi & Gil-Hernández, 2021; Giangregorio, 2023). A recent US-based study shows that parental education was associated with delayed retirement among non-

Hispanic workers (Diaz-Valdes et al., 2024), suggesting intergenerational transmission of advantages. The direct positive effect of childhood SES on late-life employment in this study, however, contrasts markedly with adulthood SES. Hence, a contextualised interpretation of childhood SES should be offered for older Chinese adults. It could be explained by social changes before and during the market transition in China that interrupted intergenerational transmission. Educational reforms in the socialist period, especially during the Cultural Revolution (1966–1976), prioritised the educational rights of children from working-class backgrounds (Deng & Treiman, 1997). The state-controlled labour market, at the same time, tended to assign jobs based on property-related family class labels (Bian, 2002; Treiman & Walder, 2019), levelling off the class advantages of prosperous households. Since the 1980s, the roles of family backgrounds in occupational and career mobility have been further weakened by intensified competition and reinforced meritocracy during market transition (Bian, 2002). This study indicates that older adults from privileged family origins may work longer to compensate for economic losses caused by early life interruptions.

Third, this study contributes to the literature by showing that lifetime social mobility trajectories could entail divergent retirement choices. In this study, I identified four trajectories of social mobility using the k-means clustering approach, including two mobile groups (downward and upward mobility) and two immobile groups (stably high and low status). Advantaged older Chinese adults were those who experienced upward mobility and stayed in higher status. Our sample shows a high rate of upward mobility of children in early life rather than middle or later adulthood. This unique pattern reflects not only social changes experienced by earlier cohorts of older Chinese adults but also declined social mobility in recent decades (X. Wu, 2019; Xie et al., 2022). I provided evidence that the odds of late-life employment were lower in these two trajectories, especially in the stably high-status group. The findings indicate that adverse childhood conditions were no longer a financial scar for older adults who gained better education and initial occupation. In mid-later life, upwardly mobile adults had improved economic well-being. This insight was also emphasised by Damman et al. (2015). Regarding stably high-

status trajectory, the consolidation of advantages could influence retirement decisions. The lowest probability of late-life employment in this group implies that advantaged older adults may have a lower reliance on labour income and prepare better for their retirement.

There was no significant difference in late-life employment between downward mobility and stably low-status trajectories. Resonating with previous discussions on intergenerational transmission, downward mobility mostly occurred in early life among older Chinese adults. It confirms that societal forces offset class advantages in pre-reform China, making downwardly mobile older adults a vulnerable group in the ageing workforce. Because older adults from downward mobility and stably low-status trajectories had accumulated fewer resources in adulthood, their destinies converged when approaching retirement. These two groups were more likely to be disadvantaged older workers and should receive attention from policymakers and researchers. In particular, diminishing early advantages caused by life interruptions in pre-reform periods may have enduring economic impacts on older Chinese adults from the baby boomer generation as well as their offspring. Because of heightening intergeneration persistence in post-reform periods (Xie et al., 2022), children of two disadvantaged groups with a low status in adulthood may encounter huge barriers to achieving economic mobility and have a potential need for providing financial support to parents.

2.5.2 Pension Eligibility Creates Unequal Retirement Choices

The results indicate that pension eligibility intervenes in the associations between lifetime socio-economic dynamics and late-life employment. Previous studies show that pension is a key driver of labour force exit among urban Chinese residents (Giles et al., 2023). The prominent roles of pension eligibility suggest that the pension system in China encouraged early exit rather than late retirement among mature workers (K. Feng, 2023). In addition, I showed that pension eligibility interacted with socio-economic inequalities in retirement decisions.

The effects of lifetime socio-economic scores and social mobility trajectories on late-life

employment were discovered mainly among pensioners. Pension eligibility may amplify social inequalities in late careers because pensioners who had higher adulthood SES or experienced upward mobility can receive more decent retirement incomes than their disadvantaged counterparts. Interestingly, SES in mid-later life was associated with lower odds of employment among non-pensioners, suggesting that these resourceful older adults may be more affected by standard retirement norms and retire from employment once eligible for pension incomes. The positive effect of childhood SES on late-life employment also appeared to be more prominent among pensioners than non-pensioners. Older Chinese adults born in advantaged households may not only experience social risks associated with family class labels (Treiman & Walder, 2019) in early life but also have to cope with retirement-related uncertainties after pensionable ages.

Regarding lifetime socio-economic trajectories, this study provides novel evidence that older Chinese adults from upward mobility and stably high-status trajectories were less likely to work after, but not before, reaching pension ages. The striking differences could be explained by both individual agency and institutional arrangements. On the agency side, upwardly mobile and stably high-status adults were two groups who could enjoy greater career success and financially prepare for retirement (Han & Moen, 1999). On the institutional side, China's retirement protection system tends to favour workers in higher occupations (K. Feng, 2023) and stable career paths. Because replacement rates of pension incomes tend to be higher in advantaged groups, their age-patterned retirement substantially expanded the variation in employment rates after pensionable ages. It indicates that retirement research should be extended to understand the life-course socio-economic dynamics of retirement because social stratification and mobility lead to more divergent late-career choices among older workers in China.

2.5.3 Extended Working Life as a Product of Financial Necessity in China

Recent retirement studies from advanced welfare regimes like the United States, Western Europe, and Nordic countries indicate that older workers with higher socio-economic po-

sitions are more likely to delay retirement (Fisher et al., 2016) and the financial necessity for bridge employment is becoming less salient (Cahill et al., 2017). For instance, Cahill et al. (2024) conclude that economic inequalities are not an important concern in late careers. These findings seem to support the “death of class” thesis (Pakulski & Waters, 2008), which highlights the diminishing significance of social class. However, the present study argues that financial necessity is still a key driver of late-career engagement among older Chinese adults, especially after pensionable ages, resonating with the “primacy of class thesis” (Radl, 2013).

First, the findings show huge socio-economic inequalities in pension income. Adulthood SES scores were positively associated with monthly pension income; such associations became stronger at the 75th percentile than the median value, suggesting that older adults with higher SES usually receive a higher pension income in urban China. Similarly, compared to stably low status, upward mobility and stably high-status trajectories were associated with significantly higher levels of monthly pension income. Although childhood SES can also increase pension income at the 50th percentile, its effect size was overly small. These findings suggest that socio-economic stratification and mobility can significantly exacerbate pension income inequalities after retirement (Veira-Ramos & Schmelzer, 2023).

Second, by comparing resident groups, this study revealed that lifetime SES scores mainly affected employment behaviours in older migrants, especially temporary rural-urban migrants. After reaching pensionable ages, temporary rural-urban migrants maintained consistently high probabilities of employment, followed by permanent rural-urban migrants and urban natives. The impressive differences could be attributed to increased differentiation in financial and welfare situations in the context of hukou-based welfare provision. Temporary rural-urban migrants are more likely to suffer from social exclusion due to the lack of urban citizenship status, limiting their economic integration in the destinations. In contrast, permanent migrants who have obtained an urban hukou may have better economic opportunities (X. Wu & Treiman, 2007) and eventually be incorporated into the urban welfare system. The findings suggest that dual welfare regimes

exist simultaneously not only between urban and rural areas (Giles et al., 2023) but also within urban China.

Third, family financial needs could affect retirement decisions, especially for disadvantaged older Chinese parents. Although family duties were assumed to be key mechanisms underlying retirement decisions, this study only observed that downward financial transfer among lower-status adults was associated with increased odds of late-life employment. More socio-economic resources and advantaged mobility trajectories were found to be important determinants of providing financial transfer to older parents or children/grandchildren. Given increasing living standards, children's financial strain may be urgent and demand a significant amount of resources from older Chinese adults. Upward transfer to parents did not affect employment behaviours, possibly because older people in China could access various public support. I did not detect any meaningful relationships between socio-economic dynamics, childcare involvement, and employment, probably because grand-parenting is a common family practice in China.

Taking together, the present study complements contemporary sociological research on retirement and late careers by showing that the long-term process of social stratification and mobility could differentiate late careers. The arguments pinpoint the critical relevance of economic motivations underlying late-life employment, especially after pensionable ages, in urban China. The findings provide key implications for social policy and human resource management. Notably, this study demonstrates a need for policymakers and service providers to reduce socio-economic disadvantages in earlier life stages, especially in early working careers. Interventions could support younger workers to mitigate their ascriptive disadvantages through equal access to education and employment. Life-course labour market policies could be introduced to prevent social risks such as unemployment and ensure equal career development opportunities for all ages. Policymakers must recognise the huge contributions of resource-poor older workers in creating new demographic dividends for the ageing workforce and raise their awareness of socio-economic inequalities before and after retirement. Retirement reforms that postpone retirement ages must be coupled with adequate policy efforts to improve retirement

protections for low-status older workers by reducing income gaps and expanding welfare rights to at-risk groups, such as temporary rural-urban migrants. For example, providing additional financial incentives and training opportunities for low-income working pensioners and older migrant workers could improve late-life economic well-being while developing the ageing workforce. Although China has made progress in integrating a variety of public pension programmes, pension gaps remain large between major schemes and must be gradually closed by lowering the entry criteria for participating in urban employee basic pension programmes and providing finances to raise the level of benefits for older adults enrolled in the resident social pension plan. Starting in 2030, the minimum years of pension contribution will be extended from 15 years to 20 years at a pace of six months per year in China. The upcoming pension reforms are expected to place greater financial pressure on disadvantaged workers in precarious or non-standard employment. For this reason, establishing more equal and decent pensions for all social groups is essential to boosting economic growth when moving towards a super ageing society.

Because disadvantaged older workers are more vulnerable to labour-demanding, low-quality jobs (Lain & Phillipson, 2019; Madero-Cabib, 2015), their working conditions must be improved through policy and service efforts that combat ageism in the labour market and promote age management within organisations. Age-friendly organisational practices could be developed to support successful ageing in the workplace while fostering older workers' retirement preparation. In this regard, retirement planning programmes could help smooth the retirement transition experience and improve retirement well-being for older workers of low socio-economic status through tailored training sessions. Finally, the massive retirement of advantaged urban workers can cause enormous economic costs for organisations and society. Employers are encouraged to adopt more progressive organisational policies to retain high-status mature workers by providing additional career development opportunities and flexible employment options.

2.5.4 Limitations and Future Research

This research unpacks the longitudinal associations between lifetime socio-economic dynamics and late-life employment before and after reaching pensionable ages. The findings of this study should be interpreted with caution. First, retrospective survey data are often criticised for recall bias, especially in older samples. Being aware of this limitation, I excluded baseline participants at more advanced ages (75+). Nonetheless, I am confident in the findings because my indicators consisted of more objective conditions in childhood and early careers. Comparative evidence has shown that retrospective life history survey data could yield reliable estimates as prospective surveys did (Jivraj, Goodman, et al., 2020). I encourage future research to adopt advanced designs, such as survey experiments, and exploit register data to explore how socio-economic (dis-)advantages influence labour market decisions in later life. Second, using PCA to construct socio-economic status indices may be subject to biases due to discrete categories. Although Kolenikov and Angeles (2009) suggest that PCA using polychoric correlations could increase the classification performance, alternative methods abound. Future researchers could improve the measurements of socio-economic dynamics over the life course by employing and evaluating different clustering approaches such as sequence analysis. Third, I measured late-life employment by the discrete labour force participation status. Because employment may take multiple forms and have a dynamic nature, future studies could disentangle the complex nature of retirement by tracing the long-term process of retirement decision-making, accounting for the type and quality of late-career jobs, and identifying emerging retirement pathways.

Last but not least, I acknowledge that the generalisability of the findings may be restricted because China is the largest developing economy. The questions as to whether and how lifetime socio-economic dynamics affect late career behaviours in other countries in South and Southeast Asia and beyond remain to be answered by future studies. Some findings may contradict retirement research from Western societies due to varied levels of development and intervention. China's retirement protection systems created a social norm of early workforce exit among advantaged older urban workers, which may present

a tremendous challenge for the ongoing policy reforms moving toward delayed retirement. Nonetheless, our evidence indicates that China is currently evolving toward a late-exit age arrangement where discourses, institutions, and older workers jointly create a new culture of ageing (Jensen, 2024). As such, more comparative studies are needed to advance our understanding of how changing welfare regimes shape economic lives in the ever-increasing older populations worldwide.

2.5.5 Conclusions

This study highlights life-course socio-economic dynamics in differentiating older adults' retirement decisions in urban China. From a stratification perspective, urban residents with higher adulthood SES are more likely to withdraw from the labour force. Interestingly, early life advantages were positively associated with employment after pensionable ages. From a social mobility perspective, upward mobility and stably high status were associated with increased odds of employment after pension ages, compared to downward mobility and stably low status. The associations between adulthood SES and employment can be explained by financial necessity because social stratification and mobility widen economic inequalities in later adulthood. Furthermore, I demonstrated that temporary rural-urban migrants and financial care providers who have a lower status may have a stronger economic motivation for late-career engagement.

Although this chapter demonstrates a generally negative association between socio-economic resources at various life stages and later-life employment, the spatial context in which retirement decisions are embedded is overlooked. In the next chapter, I will bring the neighbourhood back into retirement research by investigating how neighbourhood resources interact with individual and household resources to affect retirement opportunity structures. The findings on older migrants will be systematically extended in the fourth chapter focusing on the relationship between internal migration and work after pension ages.

Table 2.1. Descriptive statistics of the older adult sample in urban China (2011–2020).

Variable	Total	Not working	Working	<i>p</i> -value
N (%)	15,074 (100%)	8,152 (54.08%)	6,922 (45.92%)	
Pension eligibility				
Non-pensioner	24.11%	13.53%	36.58%	<0.001
Pensioner	75.89%	86.47%	63.42%	
Lifetime SES score				
Childhood SES, mean (SD)	-0.00 (0.96)	0.06 (0.99)	-0.07 (0.92)	<0.001
Young adulthood SES, mean (SD)	-0.02 (1.11)	0.18 (1.14)	-0.25 (1.03)	<0.001
Mid-later life SES, mean (SD)	-0.01 (1.10)	0.16 (1.09)	-0.22 (1.07)	<0.001
Lifetime SES trajectory				
Stably low	25.87%	21.14%	31.44%	<0.001
Downward mobility	25.05%	20.67%	30.21%	
Upward mobility	18.69%	19.14%	18.17%	
Stably high	30.39%	39.06%	20.18%	
Demographics				
Age, mean (SD)	64.47 (7.03)	66.25 (7.09)	62.38 (6.35)	<0.001
Sex				
Female	50.99%	57.90%	42.85%	<0.001
Male	49.01%	42.10%	57.15%	
Ethnicity				
Han	93.91%	93.71%	94.15%	0.21
Minority	6.09%	6.29%	5.85%	
Marital status				
Unpartnered	14.54%	18.27%	10.16%	<0.001
Married or cohabitated	85.46%	81.73%	89.84%	
Childhood residence				
Rural	77.11%	67.52%	88.40%	<0.001
Urban	22.89%	32.48%	11.60%	
Region of birthplace				

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Eastern China	34.58%	34.43%	34.74%	<0.001
Central China	27.25%	25.91%	28.84%	
Western China	29.68%	28.48%	31.09%	
Northeastern China	8.49%	11.18%	5.33%	
Current family and health conditions				
Hukou type				
Agricultural hukou	52.17%	37.60%	69.33%	<0.001
Non-agricultural hukou	47.83%	62.40%	30.67%	
Residential area				
Town	58.36%	45.73%	73.23%	<0.001
City	41.64%	54.27%	26.77%	
ADL disability				
No	82.41%	78.65%	86.84%	<0.001
Yes	17.59%	21.35%	13.16%	
Number of chronic illnesses				
None	21.75%	18.23%	25.89%	<0.001
One	25.48%	21.95%	29.63%	
Two	20.83%	21.33%	20.25%	
Three or more	31.94%	38.49%	24.23%	

Notes: *P*-values of Pearson's chi-squared tests for categorical variables and two-sample t-test for continuous variables are presented.

Table 2.2. Multilevel logistic models of late-life employment on lifetime socio-economic dynamics in urban China, 2011–2020.

	Model 1	Model 2	Model 3	Model 4
Lifetime SES score				
Childhood SES	1.176*	1.212**		
	(0.076)	(0.072)		
Young adulthood SES	0.594***	0.744***		
	(0.044)	(0.056)		
Mid-later life SES	0.637***	0.741***		
	(0.046)	(0.044)		
Lifetime SES trajectory				
(ref. = Stably low)				
Downward mobility			0.859	1.113
			(0.149)	(0.177)
Upward mobility			0.291***	0.498***
			(0.060)	(0.092)
Stably high			0.175***	0.411***
			(0.038)	(0.076)
Current conditions				
Nonagricultural hukou (ref. = agricultural hukou)		0.448***		0.417***
		(0.070)		(0.064)
City (ref. = Town)		0.305***		0.288***
		(0.057)		(0.056)
ADL disability		0.572***		0.578***
		(0.053)		(0.053)
Number of chronic illnesses				
(ref. = None)				
One		1.098		1.078

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		(0.104)		(0.103)
Two		0.785*		0.769*
		(0.095)		(0.093)
Three or more		0.572***		0.559***
		(0.075)		(0.074)
Demographics				
Age	0.832***	0.853***	0.833***	0.854***
	(0.010)	(0.010)	(0.010)	(0.010)
Male (ref. = Female)	4.756***	3.794***	4.496***	3.674***
	(0.571)	(0.438)	(0.551)	(0.423)
Ethnic minority (ref. = Han)	0.952	0.776	0.976	0.789
	(0.266)	(0.160)	(0.279)	(0.164)
Married or cohabitated (ref. = Unpartnered)	1.547**	1.480**	1.492**	1.445**
	(0.222)	(0.207)	(0.213)	(0.201)
Pensioner (ref. = Non-pensioner)	0.525***	0.557***	0.519***	0.556***
	(0.066)	(0.069)	(0.065)	(0.069)
Urban residence in Childhood (ref. = Rural)	0.179***	0.335***	0.181***	0.371***
	(0.034)	(0.057)	(0.035)	(0.066)
Region of birthplace (ref. = Eastern China)				
Central China	1.252	1.001	1.258	1.007
	(0.331)	(0.209)	(0.358)	(0.216)
Western China	1.135	0.865	1.131	0.865
	(0.334)	(0.189)	(0.345)	(0.192)
Northeastern China	0.576*	0.672	0.639	0.752
	(0.153)	(0.174)	(0.174)	(0.190)
Survey wave (ref. =				

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Baseline)

Wave 2013	1.430*** (0.131)	1.368*** (0.123)	1.430*** (0.132)	1.368*** (0.123)
Wave 2015	1.529*** (0.160)	1.487*** (0.154)	1.523*** (0.160)	1.482*** (0.152)
Wave 2018	2.072*** (0.252)	2.112*** (0.246)	2.046*** (0.250)	2.099*** (0.244)
Wave 2020	2.974*** (0.356)	3.056*** (0.374)	2.923*** (0.352)	3.023*** (0.368)
Observations	15,074	15,071	15,074	15,071
Persons	3,375	3,374	3,375	3,374
Log pseudolikelihood	-7283.768	-7127.438	-7313.180	-7139.958
ICC	0.604	0.559	0.611	0.561

Notes: Exponentiated coefficients; Robust standard errors clustered within the city are in parentheses.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 2.3. Multilevel logistic models of late-life employment on lifetime socio-economic dynamics and pension eligibility in urban China, 2011–2020.

	Model 1	Model 2	Model 3	Model 4
	Non-pensioner	Pensioner	Non-pensioner	Pensioner
Lifetime SES score				
Childhood SES	1.187 ⁺ (0.113)	1.236 ^{**} (0.086)		
Young adulthood SES	1.056 (0.117)	0.678 ^{***} (0.060)		
Mid-later life SES	0.829 [*] (0.076)	0.722 ^{***} (0.048)		
Lifetime SES trajectory (ref. = Stably low)				
Downward mobility			1.351 (0.295)	1.062 (0.183)
Upward mobility			0.895 (0.234)	0.403 ^{***} (0.083)
Stably high			1.108 (0.277)	0.316 ^{***} (0.070)
Current conditions				
Nonagricultural hukou (ref. = agricultural hukou)	0.690 (0.190)	0.350 ^{***} (0.061)	0.691 (0.189)	0.320 ^{***} (0.055)
City (ref. = Town)	0.367 ^{***} (0.101)	0.281 ^{***} (0.056)	0.346 ^{***} (0.096)	0.270 ^{***} (0.056)
ADL disability	0.443 ^{***} (0.083)	0.563 ^{***} (0.060)	0.446 ^{***} (0.084)	0.571 ^{***} (0.060)
Number of chronic				

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illnesses (ref. =

None)

One	1.235 (0.247)	1.071 (0.113)	1.219 (0.243)	1.045 (0.111)
Two	0.779 (0.162)	0.754* (0.107)	0.760 (0.156)	0.738* (0.104)
Three or more	0.607+ (0.180)	0.522*** (0.076)	0.583+ (0.174)	0.512*** (0.075)

Demographics

Age	0.888*** (0.017)	0.839*** (0.012)	0.888*** (0.016)	0.840*** (0.012)
Male (ref. = Female)	4.659*** (1.010)	3.527*** (0.456)	4.916*** (1.028)	3.340*** (0.434)
Ethnic minority (ref. = Han)	0.749 (0.244)	0.829 (0.228)	0.776 (0.243)	0.817 (0.237)
Married or cohabitated (ref. = Unpartnered)	1.464 (0.446)	1.573** (0.244)	1.412 (0.433)	1.534** (0.237)
Urban residence in Childhood (ref. = Rural)	0.428** (0.126)	0.292*** (0.057)	0.466* (0.141)	0.328*** (0.066)
Region of birthplace (ref. = Eastern China)				
Central China	0.797 (0.244)	1.065 (0.226)	0.823 (0.257)	1.072 (0.233)
Western China	0.629+ (0.180)	0.978 (0.076)	0.651+ (0.174)	0.973 (0.075)

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	(0.160)	(0.252)	(0.166)	(0.251)
Northeastern China	0.689	0.603 ⁺	0.768	0.682
	(0.330)	(0.168)	(0.370)	(0.187)
Survey wave (ref. = Baseline)				
Wave 2013	1.163	1.493**	1.160	1.499***
	(0.180)	(0.184)	(0.180)	(0.184)
Wave 2015	1.253	1.625***	1.249	1.627***
	(0.225)	(0.208)	(0.224)	(0.206)
Wave 2018	1.187	2.562***	1.189	2.551***
	(0.279)	(0.381)	(0.279)	(0.375)
Wave 2020	1.919 ⁺	3.695***	1.938 ⁺	3.661***
	(0.683)	(0.567)	(0.690)	(0.551)
Observations	3,634	11,437	3,634	11,437
Persons	1,542	3,148	1,542	3,148
Log pseudolikelihood	-1823.957	-5298.089	-1826.365	-5308.427
ICC	0.579	0.597	0.581	0.599

Notes: Exponentiated coefficients; Robust standard errors clustered within the city are in parentheses.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 2.4. Quantile regression models of monthly pension income on lifetime SES score and trajectory.

	Model 1	Model 2	Model 3	Model 4
	50th	75th	50th	75th
Lifetime SES score				
Childhood SES	25.521 [*] (10.876)	9.165 (15.281)		
Young adulthood SES	299.371 ^{***} (11.479)	468.194 ^{***} (16.128)		
Mid-later life SES	130.691 ^{***} (9.988)	162.043 ^{***} (14.034)		
Lifetime SES trajectory (ref. = Stably low)				
Downward mobility			20.205 (27.997)	73.505 ⁺ (43.996)
Upward mobility			285.026 ^{***} (31.347)	555.797 ^{***} (49.260)
Stably high			635.553 ^{***} (32.145)	932.526 ^{***} (50.513)
Current conditions				
Nonagricultural hukou (ref. = agricultural hukou)	1222.966 ^{***} (26.418)	1305.384 ^{***} (37.119)	1418.033 ^{***} (25.649)	1688.696 ^{***} (40.305)
City (ref. = Town)	137.528 ^{***} (23.415)	141.128 ^{***} (32.899)	154.179 ^{***} (23.287)	175.917 ^{***} (36.594)
ADL disability	-97.564 ^{***} (25.202)	-135.846 ^{***} (35.410)	-103.111 ^{***} (25.220)	-133.015 ^{***} (39.631)

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Number of chronic
illnesses (ref. =
None)

One	-10.410 (29.220)	24.411 (41.056)	9.527 (29.255)	23.820 (45.972)
Two	23.291 (29.942)	105.361* (42.071)	42.214 (29.985)	81.183+ (47.118)
Three or more	12.808 (28.385)	60.351 (39.883)	36.614 (28.406)	57.509 (44.638)

Demographics

Age	22.142*** (1.709)	27.581*** (2.401)	15.678*** (1.696)	20.410*** (2.665)
Male (ref. = Female)	132.098*** (20.037)	225.242*** (28.154)	171.260*** (19.716)	291.383*** (30.982)
Ethnic minority (ref. = Han)	70.441+ (41.641)	69.746 (58.508)	32.319 (41.784)	87.903 (65.661)
Married or cohabitated (ref. = Unpartnered)	109.271*** (26.838)	123.930** (37.709)	95.180*** (26.878)	163.280*** (42.237)
Urban residence in Childhood (ref. = Rural)	167.986*** (26.235)	16.113 (36.862)	176.672*** (26.689)	57.292 (41.940)
Region of birthplace (ref. = Eastern China)				
Central China	-205.780*** (25.220)	-350.926*** (35.435)	-147.501*** (25.214)	-323.601*** (39.621)
Western China	-51.915* (26.235)	-123.264*** (36.862)	-37.793 (26.689)	-110.313** (41.940)

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	(25.658)	(36.052)	(25.636)	(40.285)
Northeastern China	-209.165***	-471.760***	-207.780***	-421.517***
	(37.571)	(52.789)	(37.279)	(58.581)
Survey wave (ref. = Baseline)				
Wave 2013	119.784***	38.980	94.030**	8.690
	(31.871)	(44.781)	(31.922)	(50.163)
Wave 2015	266.652***	198.144***	200.079***	109.872*
	(33.261)	(46.734)	(33.304)	(52.334)
Wave 2018	383.771***	337.893***	293.507***	280.651***
	(31.960)	(44.905)	(31.992)	(50.273)
Wave 2020	419.317***	477.588***	350.475***	418.698***
	(33.107)	(46.518)	(33.127)	(52.057)
Constant	-1320.106***	-1130.252***	-1280.601***	-1354.976***
	(118.572)	(166.602)	(120.589)	(189.497)
Observations	9,722	9,722	9,722	9,722
Pseudo R2	0.451	0.448	0.433	0.409

Notes: Standard errors are in parentheses. Estimation used the Bofinger bandwidth method.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2.5. Multilevel logistic models of late-life employment on lifetime socio-economic dynamics by resident group (hukou type).

	Model 1	Model 2-	Model 3-	Model 4	Model 5	Model 6
	Temporary	Permanent	Urban	Temporary	Permanent	Urban
	rural-urban	rural-urban	native	rural-to-urban	rural-to-urban	native
	migrant	migrant		migrant	migrant	
Lifetime SES score						
Childhood SES	1.287*	1.055	1.121			
	(0.126)	(0.140)	(0.105)			
Young adulthood SES	0.806*	0.834 ⁺	0.715 ⁺			
	(0.081)	(0.088)	(0.125)			
Mid-later life SES	0.790**	0.592***	0.843			
	(0.063)	(0.066)	(0.110)			
Lifetime SES trajectory (ref. = Stably low)						
Downward mobility				1.315 ⁺	1.088	0.411
				(0.211)	(0.457)	(0.242)
Upward mobility				0.627*	0.473 ⁺	0.352
				(0.122)	(0.181)	(0.231)
Stably high				0.586 ⁺	0.361**	0.212*
				(0.174)	(0.123)	(0.152)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7858	3,323	3,846	7858	3,323	3,846
Persons	1,850	865	900	1,850	865	900
Log pseudolikelihood	-4096.470	-1517.768	-1449.624	-4099.985	-1525.353	-1449.535
ICC	0.532	0.586	0.617	0.535	0.594	0.617

Notes: Exponentiated coefficients; Robust standard errors clustered within the city are in parentheses. All models adjusted for age, gender, ethnicity, marital status, pension eligibility, region of birthplace, area of current residence, ADL disability, number of chronic illnesses, and survey wave. ⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

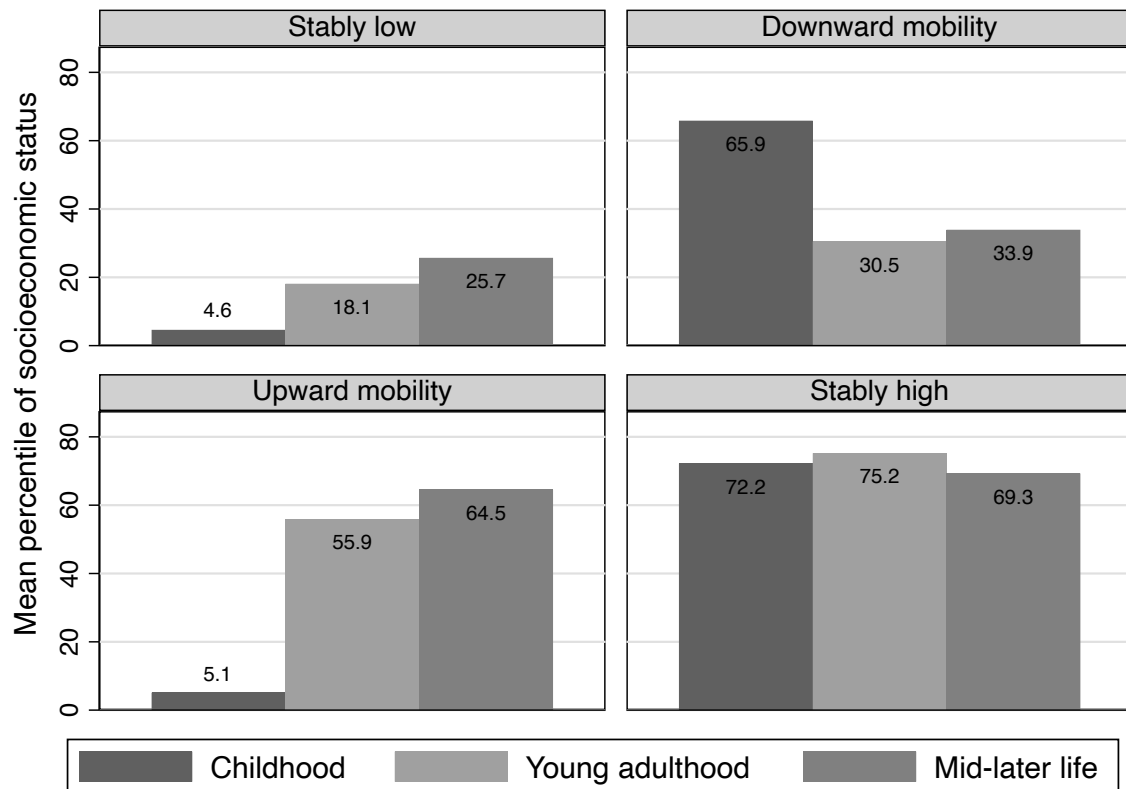


Figure 2.1. Distribution of SES scores in childhood, young adulthood, and mid-later life by lifetime SES trajectory.

Note: SES scores were transformed into percentiles from 1 to 100, with a higher score indicating higher socio-economic status.

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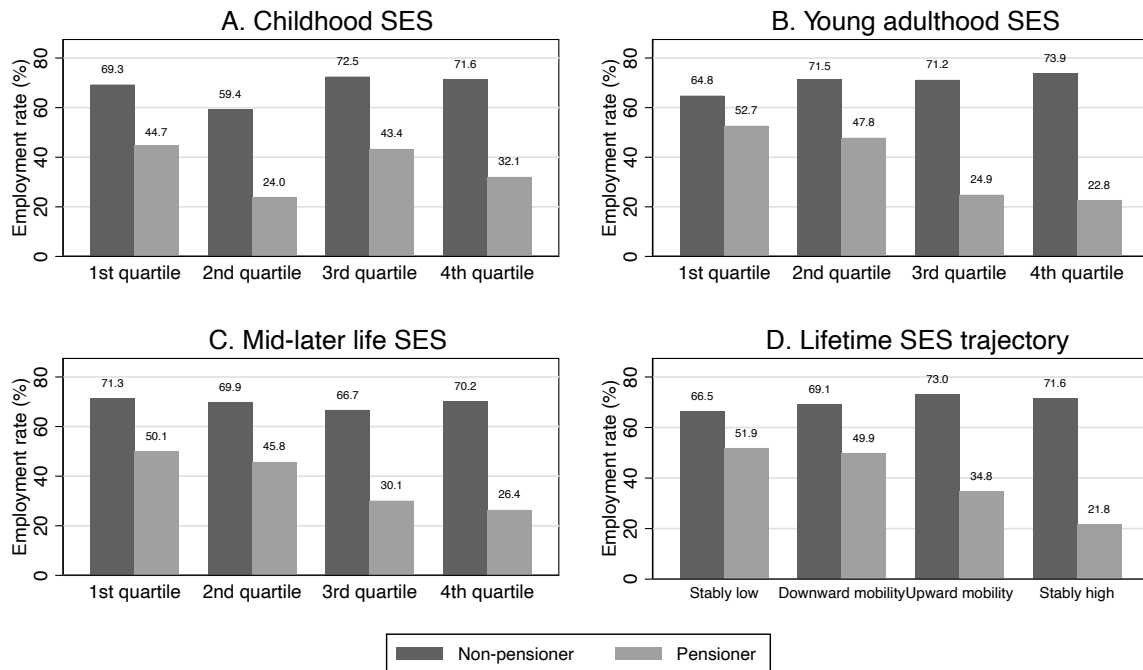


Figure 2.2. Employment rate before and after receiving a pension income by lifetime SES status in urban China, 2010–2020. Panels A, B, and C show employment rates by SES quartile; Panel D presents employment rates by lifetime SES trajectory.

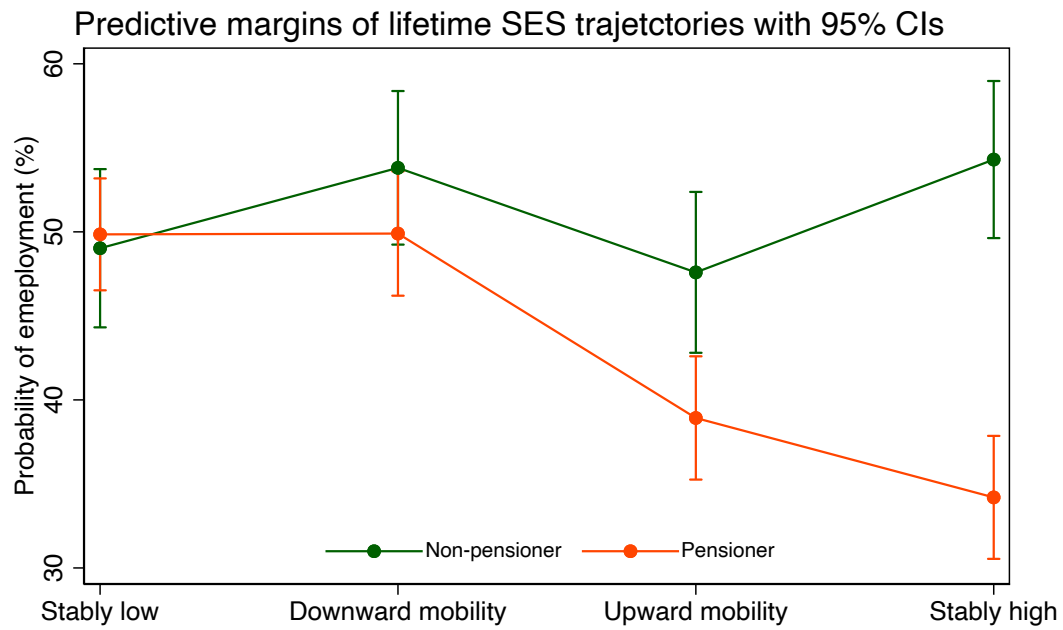


Figure 2.3. Predictive margins of lifetime SES trajectories on late-life employment in urban China, 2010–2020. Margins were obtained from the interaction term between lifetime SES trajectory and pension eligibility status and then transformed into percentages.

Supplementary Material

Table S2.1. Descriptive characteristics of SES indicators.

Indicator	Mean	SD	Min	Max
Childhood SES indicators				
Father's education	1.75	1.15	1	7
Mother's education	1.22	0.70	1	7
Father's occupation status				
Absent or not working	0.07	0.25	0	1
Farmer	0.63	0.48	0	1
Nonagricultural work	0.30	0.46	0	1
Young adulthood SES indicators				
Respondent's education	3.12	1.46	1	7
Initial occupation				
Farmer	0.57	0.49	0	1
Non-firm employee/self-employed	0.07	0.26	0	1
Firm employee	0.23	0.42	0	1
Danwei employee	0.12	0.33	0	1
Mid-later life SES indicators				
Per capita consumption	2.91	1.42	1	5
Asset index	3.90	1.57	0	6

Table S2.2. Results of principal component analysis (traditional PCA and polychoric PCA).

	Traditional PCA			Polychoric PCA		
	Eigenvalues	Proportion explained	Cum. explained	Eigenvalues	Proportion explained	Cum. explained
Childhood SES indicators						
Factor 1	1.580	0.527	0.527	1.833	0.611	0.611
Factor 2	0.868	0.289	0.816	0.777	0.259	0.870
Factor 3	0.553	0.184	1	0.391	0.130	1
Young adulthood SES indicators						
Factor 1	1.491	0.745	0.745	1.581	0.791	0.791
Factor 2	0.509	0.255	1	0.419	0.209	1
Mid-later life SES indicators						
Factor 1	1.327	0.663	0.663	1.353	0.676	0.676
Factor 2	0.673	0.337	1	0.647	0.324	1

Table S2.3 Associations between lifetime socio-economic dynamics, family care duties, and late-life employment in urban China, 2011–2018 [Odds ratios from multilevel logistic models].

	Childcare involvement		Upward transfer		Downward transfer		Late-life employment	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Lifetime SES								
score								
Childhood SES	0.923 (0.051)		1.200* (0.104)		1.052 (0.039)		1.210** (0.086)	
Young adulthood SES	1.075 (0.053)		1.171* (0.082)		1.231*** (0.046)		0.732*** (0.057)	
Mid-later life SES	1.077 (0.066)		1.236** (0.096)		1.207*** (0.051)		0.707*** (0.046)	
Lifetime SES trajectory (ref. = Stably low)								
Downward mobility		1.043 (0.133)		1.402 (0.322)		1.181+ (0.106)		1.099 (0.183)
Upward mobility		1.209 (0.165)		1.426 (0.343)		1.594*** (0.184)		0.465*** (0.093)
Stably high		1.096 (0.162)		2.428*** (0.601)		2.070*** (0.256)		0.364*** (0.072)
Family care duties								
Having living parent	0.920 (0.086)	0.909 (0.085)	69.652*** (15.729)	71.313*** (15.969)	0.787** (0.060)	0.791** (0.060)	1.025 (0.119)	1.039 (0.123)
Number of	0.916+ (0.086)	0.913+ (0.085)	0.853* (15.729)	0.840* (15.969)	1.119*** (0.060)	1.109** (0.060)	1.008 (0.119)	1.014 (0.123)

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living children

(0.048) (0.047) (0.061) (0.059) (0.038) (0.037) (0.057) (0.057)

Child co-
residence

1.899*** 1.904*** 1.091 1.099 0.591*** 0.592*** 0.985 0.969

(0.205) (0.206) (0.143) (0.143) (0.040) (0.040) (0.094) (0.094)

Childcare
involvement

1.308* 1.314* 1.241*** 1.252*** 0.939 0.928

(0.155) (0.155) (0.075) (0.076) (0.082) (0.081)

Upward transfer

1.281* 1.286* 1.645*** 1.677*** 0.971 0.961

(0.147) (0.147) (0.161) (0.166) (0.089) (0.089)

Downward
transfer

1.295*** 1.304*** 1.868*** 1.894*** 1.378*** 1.360***

(0.090) (0.091) (0.217) (0.220) (0.110) (0.108)

Controls

Yes Yes Yes Yes Yes Yes Yes Yes

Observations

10,033 10,033 10,033 10,033 10,033 10,033 10,033 10,033

Persons

3,301 3,301 3,301 3,301 3,301 3,301 3,301 3,301

Log

-5947.722 - - - -6068.972 -6088.945 -4886.019 -4897.708

pseudolikelihood

5950.682 3380.751 3385.760

Notes: Exponentiated coefficients; Robust standard errors clustered within the city are in parentheses. All models adjusted for age, gender, ethnicity, marital status, pension eligibility, region of birthplace, current hukou type, area of current residence, ADL disability, number of chronic illnesses, and survey wave. Upward transfer is defined as providing any economic support to parents or parents-in-law (1= yes, 0 = no); downward transfer refers to providing any economic assistance to children or grandchildren (1= yes, 0 = no). Information on family care duties was retrieved from the Harmonized CHARLS version D (2011–2018) on the Global Aging Data website (<https://g2aging.org/>).

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table S2.4. Multilevel logistic models of late-life employment on lifetime socio-economic dynamics by gender and pension eligibility.

	Model 1	Model 2	Model 3	Model 4
	Female non- Pensioner	Male non- Pensioner	Female Pensioner	Male Pensioner
Panel A: Lifetime				
SES score				
Childhood SES	1.288 ⁺ (0.188)	1.144 (0.136)	1.235* (0.119)	1.293** (0.104)
Young adulthood SES	1.033 (0.165)	1.064 (0.159)	0.711** (0.077)	0.649*** (0.069)
Mid-later life SES	0.678** (0.093)	0.973 (0.113)	0.742*** (0.064)	0.692*** (0.052)
Controls	Yes	Yes	Yes	Yes
Observations	1,595	2,039	6,089	5,348
Persons	701	841	1,609	1,539
Log pseudolikelihood	-893.456	-910.122	-2783.108	-2478.846
Panel B: Lifetime				
SES trajectory (ref. = Stably low)				
Downward mobility	1.062 (0.349)	2.056* (0.718)	1.152 (0.251)	1.025 (0.216)
Upward mobility	0.635 (0.238)	1.422 (0.488)	0.370*** (0.100)	0.428** (0.112)
Stably high	0.787 (0.378)	1.605 (0.547)	0.329*** (0.099)	0.316*** (0.077)
Controls	Yes	Yes	Yes	Yes
Observations	1,595	2,039	6,089	5,348

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Persons	701	841	1,609	1,539
Log pseudolikelihood	-899.154	-908.583	-2781.248	-2491.154

Notes: Exponentiated coefficients; Robust standard errors clustered within the city are in parentheses. All models adjusted for age, ethnicity, marital status, region of birthplace, current hukou type, area of current residence, ADL disability, number of chronic illnesses, and survey wave.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

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Table S2.5. Multilevel logistic models of late-life employment on lifetime SES score.

	Model 1	Model 2	Model 3
	Childhood	Young adulthood	Mid-later life
Lifetime SES score			
Childhood SES	0.894 (0.080)	1.125 ⁺ (0.072)	1.178* (0.077)
Childhood SES ²	1.042 (0.040)		
Young adulthood SES		0.469*** (0.039)	0.594*** (0.044)
Young adulthood SES ²		1.163*** (0.052)	
Mid-later life SES			0.635*** (0.046)
Mid-later life SES ²			0.978 (0.041)
Controls	Yes	Yes	Yes
Observations	15,074	15,074	15,074
Persons	3,375	3,375	3,375
Log pseudolikelihood	-7403.884	-7317.658	-7283.562

Notes: Exponentiated coefficients; Robust standard errors clustered within the city are in parentheses. All models adjusted for age, ethnicity, marital status, region of birthplace, and survey wave.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table S2.6. Multilevel logistic models of late-life employment on lifetime SES score by age.

	Model 1	Model 2	Model 3	Model 4
Lifetime SES score				
Childhood SES	1.202** (0.076)	1.191** (0.071)	1.204** (0.072)	1.206** (0.074)
Young adulthood SES	0.744*** (0.056)	0.738*** (0.056)	0.746*** (0.056)	0.738*** (0.056)
Mid-later life SES	0.741*** (0.044)	0.749*** (0.044)	0.739*** (0.044)	0.749*** (0.044)
Age	0.852*** (0.010)	0.851*** (0.010)	0.851*** (0.009)	0.851*** (0.009)
Interaction				
Childhood SES × Age	0.995 (0.008)			1.009 (0.008)
Young adulthood SES × Age		0.973*** (0.006)		0.971*** (0.006)
Mid-later life SES × Age			0.988+ (0.006)	0.997 (0.006)
Controls	Yes	Yes	Yes	Yes
Observations	15,071	15,071	15,071	15,071
Persons	3,374	3,274	3,274	3,274
Log pseudolikelihood	-7127.076	-7112.325	-7124.604	-7111.337

Notes: Exponentiated coefficients; Robust standard errors clustered within the city are in parentheses. All models adjusted for age, gender, ethnicity, marital status, pension eligibility, region of birthplace, current hukou type, area of current residence, ADL disability, number of chronic illnesses, and survey wave.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table S2.7. Multilevel logistic models of late-life employment on individual indicators of lifetime socio-economic status.

	Model 1	Model 2	Model 3
	Total	Women	Men
Childhood SES indicators			
Father's education	1.038*	1.041 ⁺	1.041 ⁺
	(0.016)	(0.021)	(0.023)
Mother's education	1.016	1.029	1.009
	(0.026)	(0.037)	(0.030)
Father's occupation status (ref. = Absent or not working)			
Farmer	1.114	0.712	1.811*
	(0.214)	(0.186)	(0.466)
Nonagricultural worker	1.105	0.697	1.899*
	(0.211)	(0.178)	(0.548)
Young adulthood SES indicators			
Respondent's education	0.977	0.991	0.960 ⁺
	(0.017)	(0.020)	(0.022)
Initial occupation status (ref. = Farmer)			
Non-firm worker	0.590*	0.542*	0.612 ⁺
	(0.138)	(0.150)	(0.168)
Firm worker	0.449***	0.396***	0.481***
	(0.062)	(0.090)	(0.089)
Government/Public institution employee	0.537**	0.504*	0.578*
	(0.106)	(0.165)	(0.128)

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Mid-later life SES

indicators

Household per capita consumption level	0.860*** (0.037)	0.873* (0.047)	0.850** (0.048)
Asset index	0.885* (0.043)	0.848** (0.048)	0.911 (0.053)

Current household and health conditions

Nonagricultural hukou (ref. = agricultural hukou)	0.482*** (0.076)	0.445*** (0.091)	0.519*** (0.095)
City (ref. = Town)	0.315*** (0.059)	0.270*** (0.063)	0.369*** (0.068)
ADL disability	0.571*** (0.053)	0.702*** (0.075)	0.423*** (0.059)
Number of chronic illnesses (ref. = None)			
One	1.101 (0.104)	0.987 (0.149)	1.237+ (0.153)
Two	0.782* (0.095)	0.655* (0.113)	0.937 (0.140)
Three or more	0.572*** (0.074)	0.551*** (0.087)	0.568*** (0.088)

Demographics

Age	0.853*** (0.010)	0.876*** (0.012)	0.830*** (0.012)
Male (ref. = Female)	3.717*** (0.432)	1	1
Ethnic minority (ref. =	0.785	0.840	0.707+

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Han)			
	(0.158)	(0.225)	(0.144)
Married or cohabitated (ref. = Unpartnered)	1.468**	1.332 ⁺	2.259***
	(0.202)	(0.202)	(0.473)
Pensioner (ref. = Non-pensioner)	0.562***	0.729*	0.466***
	(0.069)	(0.098)	(0.079)
Urban residence in Childhood (ref. = Rural)	0.401***	0.408***	0.355***
	(0.069)	(0.100)	(0.071)
Region of birthplace (ref. = Eastern China)			
Central China	0.989	0.916	1.065
	(0.210)	(0.231)	(0.258)
Western China	0.870	0.988	0.745
	(0.187)	(0.257)	(0.163)
Northeastern China	0.719	1.068	0.491*
	(0.174)	(0.268)	(0.157)
Survey wave (ref. = Baseline)			
Wave 2013	1.363***	1.450***	1.248 ⁺
	(0.123)	(0.150)	(0.150)
Wave 2015	1.476***	1.486**	1.432*
	(0.154)	(0.181)	(0.204)
Wave 2018	2.089***	2.010***	2.118***
	(0.250)	(0.295)	(0.345)
Wave 2020	3.016***	3.219***	2.717***
	(0.374)	(0.503)	(0.462)
Observations	15071	7,684	7,387
Persons	3,374	1,705	1,669

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Log pseudolikelihood	-7118.895	-3636.743	-3426.777
ICC	0.558	0.543	0.564

Notes: Exponentiated coefficients; Robust standard errors clustered within city are in parentheses.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

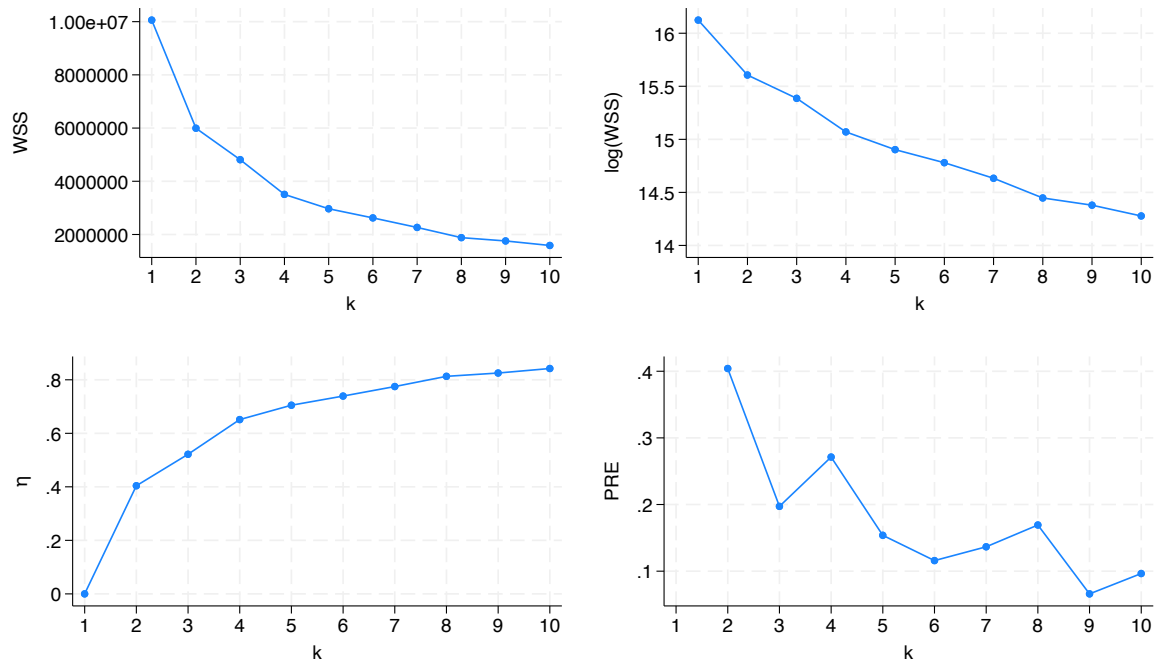


Figure S2.1. Within sum of squares [WSS], $\log(\text{WSS})$, η^2 coefficient, and proportional reduction of error [PRE] for k-means cluster solutions.

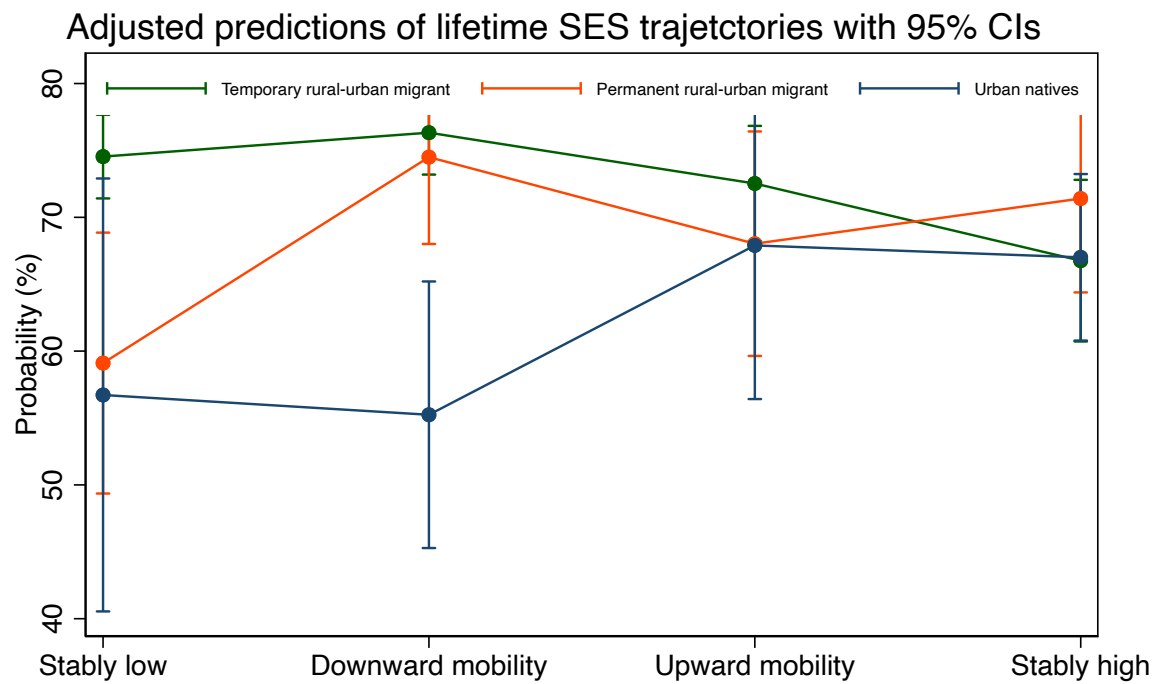


Figure S2.2. Predicated probability of late-life employment before pension age by lifetime SES trajectory and hukou change in urban China, 2011–2020 (estimated from interaction term in pooled logistic regression).

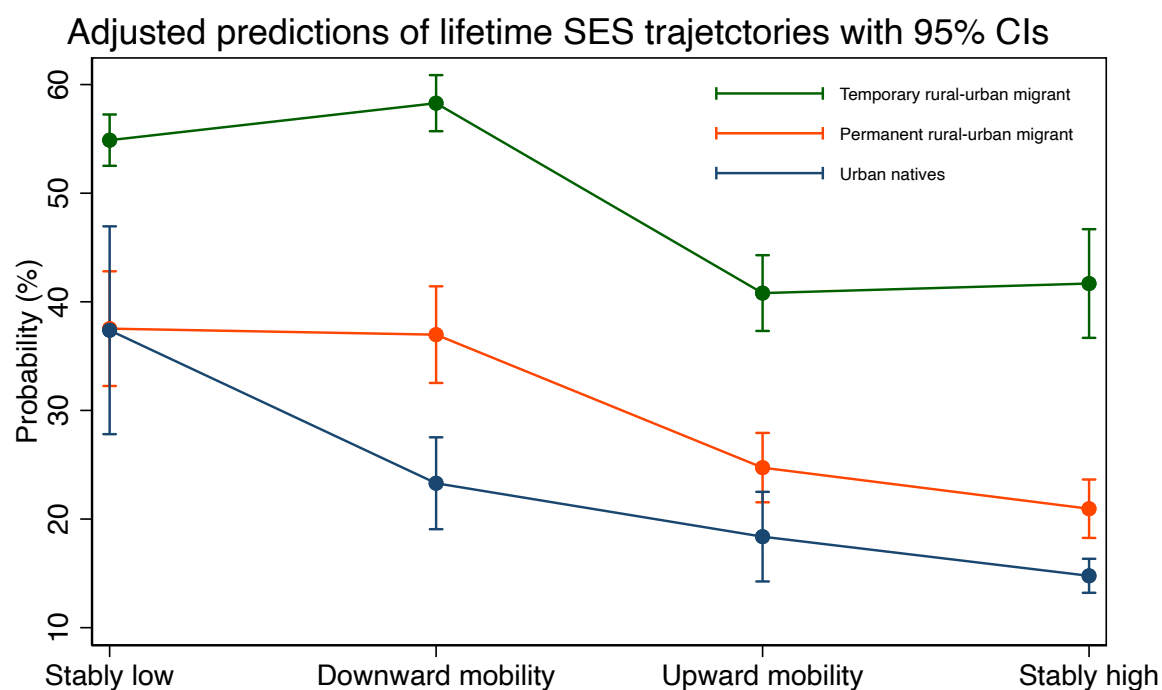


Figure S2.3. Predicated probability of late-life employment after pension age by lifetime SES trajectory and downward transfer in urban China, 2011–2020 (estimated from interaction term in pooled logistic regression).

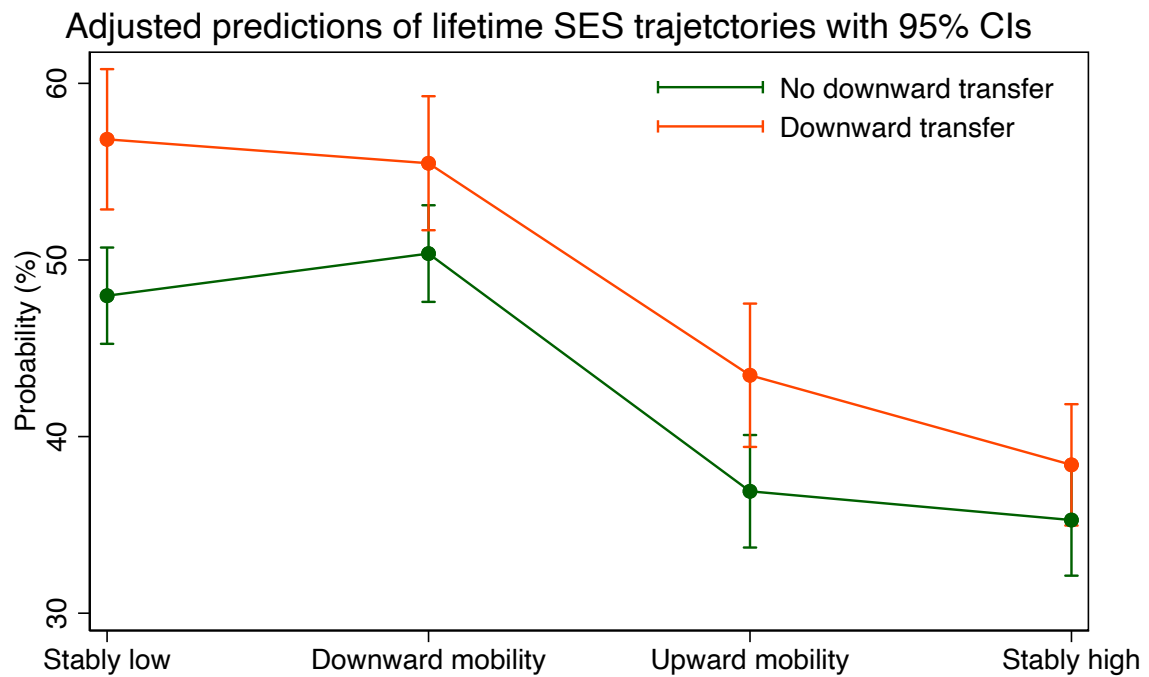


Figure S2.4. Predicted probability of late-life employment by lifetime SES trajectory and downward transfer (estimated from interaction term in pooled logistic regression).

Chapter 3

Putting Retirement into Place

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Putting Retirement into Place: Neighbourhood Socio-economic Contexts of Labour Market Exit in China

Abstract: This research explores the relationship between neighbourhood socio-economic (dis)advantages and labour market exit behaviour in late careers. It argues that neighbourhood socio-economic contexts may affect later-life employment and retirement decisions in both positive and negative ways by shaping economic opportunities and the extent of retirement security geographically. Using a nationwide sample of 5,125 older workers (baseline mean age = 58.68; 51.65% males) from the China Health and Retirement Longitudinal Study conducted between 2011 and 2020, I examined the longitudinal relationships of neighbourhood education and income with labour market exit probabilities over a decade. Results showed that 28.82% of older workers exited the labour force over the period. Older workers from both low-education and high-education neighbourhoods at baseline were 1.56 and 1.40 times more likely to stop working than older workers residing in moderate-education communities. The relationship between neighbourhood income and labour market exit probabilities was U-shaped ($p = 0.044$). The test for moderation showed that the relationship between neighbourhood income and labour market exit probability flattened among non-agricultural employees while the curve reversed among non-agricultural self-employed participants. Moreover, a flattening in the U-shaped neighbourhood income-retirement curve was mainly found in older workers from economically better-off families. The findings indicate that neighbourhood socio-economic contexts differently affect older workers' retirement decisions, with older workers from deprived and privileged neighbourhoods having a higher likelihood of employment termination. Individual and family resources can modify the neighbourhood effects on retirement, leaving disadvantaged workers more sensitive to neighbourhood resource environments.

Keywords: Family resource; Labour market exit; Neighbourhood (dis)advantage; Retirement decisions; China

3.1 Background and Objectives

Residential places, especially the neighbourhood, play a prominent role in our daily lives. Neighbourhood, referring to “the bundle of spatially based attributes associated with clusters of residences” (G. Galster, 2001, p.2112), can affect its residents’ life chances and well-being. It is also well-known that the neighbourhood effects are not transient and may persist over individual life courses (Elder et al., 2003). While understanding how neighbourhood environments affect younger people’s developmental and economic opportunities (Browning et al., 2016) and whether neighbourhood environments are associated with health in mid-later adulthood (Jivraj, Murray, et al., 2020; Mair et al., 2008; Pickett, 2001) remains two valuable lines of inquiry, the investigation into whether and how the neighbourhood is relevant for late-career outcomes, notably retirement, is also imperative. In ageing societies, older adults are valuable human resources in the labour force and must be supported by building age-friendly communities (WHO, 2007). With rapid urbanisation and socio-economic development, however, we know little about the neighbourhood context of late-career decision-making. This research aims to address this limitation by investigating the neighbourhood effects on late working life in ageing China, where the share of urban populations has increased from 36% to 65% over the past two decades.

The landscape of retirement is undergoing dramatic changes due to accelerating demographic ageing coupled with policy reforms. Instead of leaving the world of work early, many mature workers seek opportunities for continuing labour force participation beyond pensionable ages. Extended working life has been recognised as a crucial policy strategy to mitigate the rising pressure of lengthened longevity and labour shortage (Ogg & Rašticová, 2020). In developed countries, sizeable proportions of mature workers, for example, more than 60% in the United States (Cahill et al., 2006), delay their retirement and stay economically active through diversified employment choices later in life (Calvo et al., 2018; Kojola & Moen, 2016; Turek et al., 2024). Longer working life is not a unique phenomenon in the Western world, as it is now becoming increasingly prevalent in many Asian societies like China, India, and Indonesia. For example, Chinese men stayed, on

average, two years longer in the labour market than their counterparts in industrialised economies (OECD, 2021). Especially in rural China, older people cannot afford to retire due to under-developed formal social security (de Brauw & Rozelle, 2004).

Life course theorists argue that historical times and spaces shape individual life courses (Elder et al., 2003), and the place where people live or ever lived for a long term can have lasting imprints on life chances. The retirement literature has recognised that retirement is a decision-making process that involves *cost-benefit considerations in context* (Feldman, 1994). Empirical research on retirement and late working life has extensively discussed individual, family, and work-related factors associated with retirement (M. Wang & Shultz, 2010; M. Wang et al., 2008), but left the neighbourhood effects understudied. Moreover, extant research has extensively explored retirement and late careers in industrialised settings (Beehr, 2014; Henkens et al., 2018; M. Wang & Shultz, 2010) but paid insufficient attention to recent changes in labour markets and retirement landscapes in developing economies, where the lion's share of global older workers populations are facing growing challenges in making late-career decisions.

By integrating perspectives on retirement, environmental gerontology, and neighbourhood effects, this research aimed to contextualise late-career behaviours in the neighbourhood by exploring the role of neighbourhood socio-economic (dis)advantages in shaping late-career transitions. It focused on the following three questions regarding the transition from employment to retirement: First, to what extent do neighbourhood contexts affect labour market exit? If people from the same community share considerable similarities in retirement decisions, policymakers and service providers must pay more attention to the living spaces that may constrain the life chances of older workers. Second, whether the relationships between neighbourhood socio-economic resources and labour market exit behaviour vary by the level of individual and household resources? Third, do urban and rural workers respond to neighbourhood contexts differently? These questions are of great importance for understanding late career behaviours among older workers because retirement decisions are made in a broader social-cultural context through everyday interactions between family members and peers in the community.

3.2 Theoretical Background and Hypotheses

3.2.1 Neighbourhood Effects on Employment Outcomes

Several theories offer rich insights into later-life adaptations in the neighbourhood context. First, according to the multilevel perspective of retirement (Szinovacz, 2003, 2012), local and regional infrastructures can assemble the opportunities and barriers for older workers. Specifically, the multilevel perspective for retirement delineates two-fold roles of neighbourhood environments in retirement decision-making: On the one hand, older people's post-retirement lifestyle pursuits and family responsibilities are usually constrained by community environments and resources (Szinovacz, 2012); On the other hand, well-developed local infrastructures can protect older workers against economic uncertainties (Szinovacz, 2003).

In addition, the burgeoning neighbourhood effects scholarship further explains why the neighbourhood may impact labour market behaviours. In the seminal book *The Truly Disadvantaged*, for example, Wilson (2012) demonstrates that people from deprived inner-city neighbourhoods were particularly vulnerable to joblessness and economic problems. Much evidence has supported that people living in deprived areas tend to experience a lower employment rate and a higher risk of social exclusion (Atkinson & Kintrea, 2001; Buck, 2001; Manley & van Ham, 2012). Neighbourhood theorists argue that the socioeconomic resources of the community can influence workers' access to jobs and the quality of employment. Both mechanisms internal and external to the community can play a role. Internally, the employment behaviours of residents are influenced by social values and informal ties. Because people rely on informal social networks, such as *guanxi* in China (Bian, 2018), and role models during the job search process, those living in disadvantaged communities may have more barriers to accessing high-quality job information (G. Galster et al., 2010). Besides, the neighbourhood stigma mechanism indicates that residents of poor neighbourhoods may be discriminated against by employers, leading to a higher risk of unemployment. Although researchers on neighbourhood effects have demonstrated a growing interest in studying labour market outcomes, most studies focus primarily on

labour force participation among adults of younger ages. The lack of attention to retirement and late-career behaviours may lead to a misconception that the neighbourhood is less important for older workers.

Moreover, in environmental gerontology, later-life behaviours are understood within the transactions between older adults and their environments. According to Lawton (1985), the transactions could have differential impacts on older adults' behavioural change. The first type of response is reactivity. Under environmental pressure or constraint, older adults may develop negative emotions, such as anxiety about the living environment, and, therefore, refrain from certain goals and behaviours to reduce stress. In addition, proactivity may occur when older people actively exert their agency to improve the fit between the environment and their desired behaviours. Unlike the multilevel perspective of retirement, environmental gerontology highlights the interactions between neighbourhood and individual resources. Notably, the environment docility hypothesis suggests that less competent older people have a higher dependence on their environments (Lawton & Simon, 1968). It implies that older people's behavioural responses to neighbourhood contexts are contingent on their resources and competence.

The neighbourhood effect scholarship further argues that the neighbourhood can cause non-linear and threshold effects because of the heterogeneity of residents, multidimensional neighbourhood attributes, as well as the interaction between individuals, families, and their neighbourhoods (G. C. Galster, 2018). Both Lawton (1985)'s discussion about person-environment relationships and Browning et al. (2016)'s emphasis on differential exposure and differential reception have implicitly discussed such complexity underlying neighbourhood effects. These theories indicate that the transaction between neighbourhood resources and individual or family resources may generate more nuanced effects on later career adaptations among older workers. Therefore, it is imperative to explore how older workers respond to their neighbourhood socio-economic contexts during retirement transitions.

3.2.2 Conceptual Framework and Hypotheses

In this research, I advocated for cross-fertilisation of different perspectives on employee behaviour, retirement, and neighbourhood to advance the understanding of neighbourhood effects on late careers. It is argued that workers' late-career decisions are made in the neighbourhood context (Strauss, 2008). Researchers have suggested that neighbourhood effects in labour market behaviours are not trivial in magnitude and should be treated seriously (Z. Feng et al., 2016). Here, I propose a conceptual framework to advance the theorisation of the relationships between neighbourhood socio-economic contexts and late-career behaviour (Figure 3.1). I argue that neighbourhood socio-economic status is associated with labour market exit among older workers. I focus on the socio-economic contexts because neighbourhood socio-economic resources connote a core dimension of neighbourhood (dis-)advantages (Deas et al., 2003; Townsend, 1987) and may have fundamental influences on other neighbourhood-level attributes and older workers' economic behaviours. In light of potential heterogeneous neighbourhood effects (G. C. Galster, 2018), the framework posits a non-linear relationship that older workers from neighbourhoods either affording few employment opportunities or providing more retirement security may be more likely to withdraw from the labour force. This non-linear relationship is expected to be affected by individual and family resources. Additionally, I further situate the neighbourhood effects on late-career behaviours in a geographic context where rural and urban variations in late-career behaviours will be explored.

[Inset Figure 3.1 here]

Neighbourhood Socio-economic Resources and Late-Career Behaviour

The literature suggests that retirement decisions are shaped by the opportunity structure an older worker faces before transitioning into a full retirement (Feldman, 1994; Szinovacz, 2003). In this study, the first argument is that neighbourhood socio-economic resources can have both positive and negative impacts on late-career behaviours. Individual economic opportunities are closely related to residential neighbourhoods where people live. As a result, different resource environments can lead to divergent employment de-

cisions, especially in later careers. Older workers from disadvantaged neighbourhoods may be pushed from employment due to the lack of economic opportunities and work abilities, whereas older workers residing in opportunity-rich communities may be pulled to retirement life (Szinovacz, 2003, 2012).

Research has shown that residents from deprived neighbourhoods may have worse employment outcomes, such as unemployment. Conceptually, neighbourhood deprivation is a bundle of compositional and socio-economic characteristics (Townsend, 1987). Neighbourhood socio-economic status is a key dimension of neighbourhood deprivation and is featured by the levels of poverty, unemployment, and education (Deas et al., 2003; Manley & van Ham, 2012). Evidence has shown that people in deprived areas are vulnerable to labour market disengagement and social exclusion (Atkinson & Kintrea, 2001; Buck, 2001; Manley & van Ham, 2012). Moreover, researchers have argued that the effects of neighbourhood socio-economic deprivation on employment outcomes can persist over time (Chetty & Hendren, 2018a; Miltenburg & van de Werfhorst, 2017). For older workers, neighbourhood disadvantages may affect their transition between work and retirement. In the UK, Murray et al. (2019) reported that area disadvantage, indicated by the unemployment rate, can increase the propensity of early retirement among older adults. It is understandable in developed countries because disadvantaged older workers can receive more incentives to claim disability pensions or early retirement benefits. In addition, exposure to adverse neighbourhood environments may increase the risk of health issues (Diez Roux & Mair, 2010), reducing older residents' work capability. Thus, it can be expected that older workers in more deprived communities may be more likely to exit the labour market.

Advantaged neighbourhoods can benefit employment outcomes in early and middle adulthood. Research shows that young adults from resource-rich neighbourhoods have higher occupational aspirations (Furlong et al., 1996) and earn more income (Chetty & Hendren, 2018a). For older workers, advantaged labour market chances over the life course can enable them to amass sufficient wealth for retirement. As such, a different relationship between neighbourhood socio-economic conditions and retirement may emerge

as a result of rapid community development. I argue that older workers from higher socio-economic neighbourhoods may also exit from the labour force early for two reasons. First, communities that afford rich employment opportunities can improve employment security and facilitate retirement preparations throughout the whole career. Fewer unemployment breaks in the past life and better access to good jobs are essential to ensuring retirement security. With a stable and secure career path, older workers approaching retirement age may be more likely to conform to traditional retirement policies (Henretta, 2017). Second, older workers in advantaged communities may have a higher desire to embrace leisure life (Szinovacz, 2003). This process may also be driven by the social and emotional ageing process (Carstensen, 2021) because older people in well-developed neighbourhoods may value emotionally rewarding activities more than paid work. Abundant neighbourhood resources constitute the pull factors of retirement and, consequently, lead to retirement from the labour market among their residents. In this regard, I also expect that older workers in advantaged neighbourhoods may have a higher probability of labour market exit.

The relationship between neighbourhood socio-economic status and retirement may be non-linear because the probability of labour market exit may be higher in both deprived and advantaged neighbourhoods. This implies a U-relation that the labour market exit probability may increase as neighbourhood socio-economic resources grow, but after reaching a certain point, the probability of labour market exit may increase with the improvement in neighbourhood socio-economic status. Therefore, I propose the first hypothesis below:

Hypothesis 1: *The association between neighbourhood socio-economic status and labour market exit is U-shaped. That is, as neighbourhood socio-economic resources increase, the likelihood of labour market exit will decrease, followed by an increase upon neighbourhood socio-economic resources reaching a point.*

Moderation Roles of Individual and Family Economic Situations

Older workers' retirement decision-making should be understood in the life course and household context. According to the multilevel perspective of retirement (Szinovacz, 2003), individual and family resources may interact with neighbourhood socio-economic status to influence retirement opportunity structures. Among various individual resources, career represents one of the most important factors influencing employment preferences and retirement timing (Henretta, 2017). Occupation may form different constraints and opportunities for late careers. The literature has shown that high-status occupations can provide older workers with more stable career paths and better prospects of retirement security (Han & Moen, 1999; Henretta, 2017). Hence, I expect that older employees and self-employed adults may react differently to neighbourhood socio-economic contexts. Because self-employed adults lack employment security, their neighbourhood socio-economic contexts may have a stronger impact on their retirement decisions. Older employees may be more likely to follow the institutional retirement pathways and less likely to be affected by neighbourhood socio-economic conditions.

Hypothesis 2: *The non-linear association between neighbourhood socio-economic status and labour market exit is weaker in non-agricultural employees than workers in non-agricultural self-employment and farm work.*

Late-career behaviour is often viewed through a household decision-making perspective (Gustman & Steinmeier, 2000; Loretto & Vickerstaff, 2013). Rational older workers may formulate their own late-career decisions that maximise the family utility (Gustman & Steinmeier, 2000). In deprived communities, where employment opportunities are restricted, older workers from lower-income families may be unlikely to stay in the labour force, due to double disadvantages. However, in resource-rich communities, older workers from lower-income families could be impelled by the dominant leisure culture to follow their peers to enter retirement. Because older workers from economically better-off families have better employment opportunities and can maintain economic independence in retirement life, they may be less responsive to their neighbourhood socio-economic environments. Hence, it could be anticipated that the retirement decisions of older work-

ers from lower-income families may be more sensitive to neighbourhood socio-economic status.

Hypothesis 3: *The non-linear association between neighbourhood socio-economic status and labour market exit is weaker in higher-income families than in lower-income families.*

Rural-Urban Differences

The labour market differs substantially in urban and rural regions, with the former offering more skill-intensive employment opportunities (Young, 2013). Despite widely reported urban-rural gaps in employment and wages, China's regional divide may deserve special attention here for three reasons. First, due to regional differences in socio-economic development, limited access to non-agricultural employment in rural areas has spurred huge rural-to-urban migrant flows in China. Rural residents may have a higher tendency to make employment and retirement decisions based on their residential environments than their urban counterparts. In addition, China's *hukou*-based pension and welfare systems have produced significant regional differences. In urban areas, most older workers are enrolled in the employment-based pension scheme or the urban resident pension schemes, which offer a generally higher level of pension benefits than the pension programmes for rural residents (Zhu & Walker, 2018). Moreover, given that rural areas sustain close kinship ties and social networks between neighbours, rural residents may be more susceptible to social expectations regarding work and inactivity. Taking together, the neighbourhood socio-economic contexts may be more relevant for the retirement decision-making in rural residents than urban residents.

Hypothesis 4: *The non-linear association between neighbourhood socio-economic status and labour market exit is weaker in urban areas than in rural areas.*

3.3 Methods

3.3.1 Data and Sample

This study used five waves of longitudinal data from the China Health and Retirement Study (CHARLS) collected from 2011 to 2020. The CHARLS is a nationally representative survey of community-dwelling residents aged 45 or above and their spouses in China (Zhao et al., 2014). The baseline survey was implemented in June 2011 and 2012 using a stratified, multi-stage, and probability-proportional sampling technique. In the first stage, 150 county-level units were chosen from a list of counties and urban districts (from all provinces except Xizang) across the nation stratified by area type (rural or urban) and GDP per capita. Then three communities were randomly selected from each county/urban district with probability proportional to population, yielding 450 primary sampling units. Within each community, the survey team randomly selected 80 households to conduct in-person interviews. Eligible households should have at least one family member aged 45 or above. The baseline sample consisted of 17,708 middle-aged or older respondents with their spouses. The baseline sample was recaptured in 2013 (wave 2), 2015 (wave 3), 2018 (wave 4), and 2020 (wave 5), with a longitudinal response rate of 82.61%, 78.45%, and 77.24%, respectively (Zhao et al., 2020).

This research adopted a prospective cohort design, tracing the labour market dynamics of older workers in a decade from 2011 to 2020. The study sample included older workers interviewed in 2011 and at least one follow-up survey. As I only included employed baseline participants, those who were unemployed, retired, and never worked at baseline were excluded. I focused on female workers aged 50–64 and male workers aged 55–69 at baseline because China’s formal retirement age for female blue-collar workers is 50 and for male workers is 60. Workers who do not participate in employment-based pensions are likely to receive pension income from resident pensions at or after age 60. As such, the age range allowed the baseline participants to experience retirement in subsequent survey waves. Participants whose household was registered in other counties/cities or foreign countries were excluded due to the lack of long-term residence in current lo-

cales. I dropped participants who had missing data on employment status and baseline household income. Multiple imputations with chained equations were performed to handle missing data in community-level variables. To increase the accuracy of imputations, I included a set of auxiliary variables at both community and city levels. The sample had 5,125 older workers, with a total of 23,628 person-year observations (mean = 4.61).

3.3.2 Measures

Labour Market Exit

In literature, retirement is usually defined as older workers' withdrawal from the labour force (Atchley, 1982b; Denton & Spencer, 2009). At baseline, all participants engaged in economic activities, which broadly included non-farm employment, non-agricultural self-employment or unpaid family helpers, agricultural self-employment, and agricultural employment. I measured labour market exit using the changes in employment status in follow-up surveys. Labour force exit was a dummy variable, coded as 1 if the respondents transitioned into non-employment (not in paid work) and 0 if the respondents remained in the labour force. I treated unemployment as labour force exit because (1) most unemployed participants indicated a low willingness to return to work and (2) later-life unemployment accompanied a high risk of permanent labour market withdrawal.

Neighbourhood Socio-economic Status

Socio-economic status is a multidimensional concept that denotes the level of social and economic standing in society. Education and income are two key indicators of socio-economic status. The present study measured neighbourhood socio-economic status by neighbourhood educational composition and income level (Deas et al., 2003). For each community, a community cadre familiar with community information and having access to key statistics was invited to report the community's per capita net income and percentages of residents with or without formal education. Additional percentage brackets were provided if the cadre was unaware of the exact percentage points. I constructed a neighbourhood education variable according to the shares of residents with senior high

school education (10% or higher versus less than 10%) and without formal education (illiterate/semi-literate, 20% or less than 20%). The variable had three categories: (1) low-education neighbourhoods that had at least 20% of illiterate or semi-literate residents; (2) moderate-education neighbourhoods if both the shares of illiterate/semi-literate and better-educated residents were lower; and (3) high-education neighbourhoods with at least 10% of better-educated residents and fewer illiterate/semi-literate residents. This operationalisation enabled us to more directly capture the heterogeneous effects of neighbourhood education relative to alternative measures (such as the proportion of junior high school education or the use of multiple items).

For income, I transformed the community's per capita net income using a natural log to reduce its skewness. Missing data in neighbourhood log income (and implausibly low values: 23 yuan or less per person) and education was imputed using truncated regression and logistic regression models, respectively. A set of auxiliary predictors at the community (like area type) and city levels were included in imputation equations. Thus, under-education and a lower income indicate greater socio-economic disadvantage in the community.

Baseline Occupation and Household Income

Baseline occupation was a discrete variable with the following three groups: (1) agricultural work; (2) non-agricultural employment; and (3) non-agricultural self-employment/family business helper. Household total income was an aggregated variable that subtracted debts from all sources of family income and public transfers. I obtained per capita income after dividing the household's total income by the number of household members. The CHARLS team already imputed household income at baseline. I obtained five quintiles stratified by area of residence to measure relative household income level (1–5), with a larger value indicating a better family economic situation.

Community and Demographic Characteristics

I controlled the community's area of residence (urban or rural) and geographic location, which were found to affect neighbourhood socio-economic situations and individual labour market behaviours in literature. The longitude and latitude of the corresponding city were continuous variables. In China, coastal regions in the south and east are more developed than central and western areas.

At the individual level, I included the respondents' age (in years), sex, education, marital status, and household registration location. Household registration location was a binary variable measuring whether the respondents' household was registered in another community (yes or no). I also controlled the survey wave in all regression analyses.

3.3.3 Analytical Strategy

I first estimated the effects of neighbourhood education and income on labour force exit using multilevel logistic regression models. Because the data was clustered at the person and community levels, three-level random-intercept models were adopted. I compared multi-level logistic regression with panel random-effect logistic regression and the goodness-of-fit indices favoured the former method. Interclass correlation (ICC) coefficients from the constrained multi-level model were non-trivial ($ICC_{community} = 0.117$; $ICC_{person} = 0.514$), suggesting that I must account for the clustering effects. At level 1, timing-varying person-level variables were included, such as age, marital status, and survey wave. Level 2 included person-level constant features like sex, education, baseline occupation, and household income. At level 3, neighbourhood socio-economic status and other community-level control variables were included. Let P_{itw} denote the probability of labour market exit at time t of individual i from community w , the multilevel logistic model can be written as

Level 1(Person-year observation):

$$\log\left[\frac{P_{itw}}{1 - P_{itw}}\right] = \alpha_{iw} + \gamma_1 \sum (Z_{itw}) + \gamma_2(time_{itw}) + \omega_{itw} \quad (3.1)$$

Level 2 (Person):

$$\alpha_{iw} = \alpha_w + \lambda_1(Occupation_{iw}) + \lambda_2(Household_income_{iw}) + \lambda_3 \sum(Z_{iw}) + \mu_{iw} \quad (3.2)$$

Level 3 (Neighbourhood):

$$\begin{aligned} \alpha_w = & \alpha_0 + \beta_1(cLow_edu_w) + \beta_2(cHigh_edu_w) + \\ & \beta_3(cIncome_w) + \beta_4(cIncome_w^2) + \gamma_3 \sum(Z_w) + \bar{\mu}_i \end{aligned} \quad (3.3)$$

where $\sum(Z_{itw})$ is a vector of person-level time-varying factors and $time_{itw}$ is time point. At level 2, $Occupation_{iw}$ and $Household_income_{iw}$ are individual and family resource factors, whereas $\sum(Z_{iw})$ denotes person-level control variables. $cLow_edu_w$ and $cHigh_edu_w$ represent two categories of neighbourhood education, treating moderate-level education as the reference group. Polynomial regression was modelled by introducing linear community income ($cIncome_w$) and its quadratic term ($cIncome_w^2$) at level 3. If β_1 and β_2 have the same signs, the relationship between neighbourhood education and labour market exit would be non-linear. The relationship between community income and labour force exit might be non-linear if meeting the two requirements below: (1) the quadratic term's coefficient β_4 was statistically significant and (2) the turning point was located within the data range (Lind & Mehlum, 2010). A U-relation between neighbourhood income and labour market exit would occur when β_3 is negative and β_4 is positive.

To test the moderation hypotheses, I included cross-level interaction terms between occupation, household income, and neighbourhood socio-economic status in regression models. The new equations at level 3 can be written as follows:

Occupational effect:

$$\begin{aligned}
\alpha_w = & \alpha_0 + \beta_1(Low_edu_w) + \beta_2(High_edu_w) + \beta_3(Income_w) + \beta_4(Income_w^2) + \\
& \beta_5(Low_edu_w) \times (Occupation_{iw}) + \beta_6(High_edu_w) \times (Occupation_{iw}) + \\
& \beta_7(Income_w) \times (Occupation_{iw}) + \beta_8(Income_w^2) \times (Occupation_{iw}) + \\
& \gamma_3 \sum (Z_w) + \bar{\mu}_i
\end{aligned} \tag{3.4}$$

Household income effect:

$$\begin{aligned}
\alpha_w = & \alpha_0 + \beta_1(Low_edu_w) + \beta_2(High_edu_w) + \beta_3(Income_w) + \beta_4(Income_w^2) + \\
& \beta_5(Low_edu_w) \times (Household_income_{iw}) + \beta_6(High_edu_w) \times (Household_income_{iw}) + \\
& \beta_7(Income_w) \times (Household_income_{iw}) + \beta_8(Income_w^2) \times (Household_income_{iw}) + \\
& \gamma_3 \sum (Z_w) + \bar{\mu}_i
\end{aligned} \tag{3.5}$$

In equations 3.3–3.5, I centred neighbourhood income and household income using the grand mean values at baseline. The mean values of variance inflation factors (VIFs) for interaction models were lower than 2, showing no presence of multicollinearity issues. I graphed the moderation effects of occupation and household income using predictive margins.

Finally, I explored the heterogeneous relationships between neighbourhood socioeconomic status and labour market exit in sub-samples stratified by area of residence and gender. All standard errors were clustered at community levels to allow for interdependence between neighbours. Because the three-level models accounted for heterogeneity at various levels, the effect sizes might be reduced compared to binary response regression models with simpler specifications.

3.4 Empirical Results

3.4.1 Descriptive Results

Table 3.1 presents the descriptive characteristics of the sample at baseline. At baseline, the sample had a mean age of 58.68 years ($SD = 4.41$) and 51.65% of males. The educational level of the respondents was modest, as only one in four completed education in junior high school or above (at least nine years). Most of the respondents were married (92.82%) and permanently residing in the current community (92.33%). About two-thirds were engaged in agricultural work, 22.79% had a non-agricultural job, and the remaining 8.53% were self-employed in their own or family business. This study included 427 communities, with 23.42% being low-education neighbourhoods. The mean community-level per capita income was 8.11 ($SD = 0.99$; equivalent to 515 US dollars in 2011). Concerning area type, 44.73% of the communities were located in urban areas.

[Inset Table 3.1 here]

The prevalence rates of labour market exit increased with time (Table 3.2). At Wave 2, 17.68% of the baseline workers left the workforce. The proportion of retired/inactive adults increased to 28.82% in 2020. Over the period, men and women had generally analogous rates of job exit (women: 29.46%; men: 28.18%), although more women exited in earlier waves. I also observed that the rates of labour force exit were significantly higher in urban residents than in rural participants. After a decade, 40.02% of urban workers stopped working, but approximately three in four rural residents stayed in the workforce.

[Inset Table 3.2 here]

3.4.2 Neighbourhood Socio-economic Status and Labour Force Exit

Results of multilevel logistic models of labour market exit on neighbourhood socio-economic contexts are displayed in Table 3.3. In the first model, I only included neighbourhood education and income. Community-level control variables were adjusted in

Model 2. In the third model, I introduced individual-level control variables.

[Inset Table 3.3 here]

As for education, I observed that both low- and high-education neighbourhoods were associated with higher odds of labour market exit. The effects of neighbourhood education decreased after adjusting for community-level characteristics. In the fully adjusted Model 3, the coefficients of low-education and high-education neighbourhoods were 0.445 and 0.339, suggesting that older workers from low-education and high-education communities were 1.56 [Odds ratio [OR]: $\exp(0.445)$] and 1.40 [OR: $\exp(0.339)$] times more likely to exit the labour market, compared to those living in average-education neighbourhoods.

The linear term neighbourhood log income was not statistically significant in Model 1 (log odds = 0.107, *n.s.*), but its quadratic term showed a positive association with labour market exit (OR: $\exp(0.116) = 1.122$, $p < 0.01$). The positive association between squared neighbourhood log income and labour market exit weakened after including community-level characteristics. In Model 3, the coefficient of linear neighbourhood log income was negative (log odds = -0.036) and non-significant. The coefficient of squared neighbourhood log income decreased to 0.079 (OR = 1.08) and reached the statistical significance level of $p < 0.1$. I tested whether the non-linear relationship between neighbourhood income and labour market exit was present in Model 3 using the procedure of Lind and Mehlum (2010). Results confirmed that the relationship between neighbourhood income on labour market exit probabilities was U-shaped ($p = 0.044$), with a turning point located at 0.226, slightly higher than the mean of centred neighbourhood income. As shown in Figure 3.2, older adults' labour market exit probability decreases with the growth of neighbourhood income before the turning point, followed by an increase as neighbourhood income rises.

[Inset Figure 3.2 here]

The results supported Hypothesis 1 that neighbourhood socio-economic status has both positive and negative impacts on labour force exit behaviour. Both neighbourhood education and income had U-shaped relations with labour market exit probability. Older workers in neighbourhoods with lower or higher socio-economic status may be more likely

to stop working than older adults in moderate-level socio-economic neighbourhoods.

3.4.3 The Roles of Occupation and Household Income

Table 3.4 presents the results of the moderation effects of individual occupation and household income. In Model 1, I tested the interactions between occupation, neighbourhood education and income. The main effects of occupation on labour market exit were non-significant. The linear interaction terms between occupation and neighbourhood log income showed negative signs and were statistically significant at $p < 0.1$. The quadratic interaction between neighbourhood log income and non-agricultural self-employment was negative and statistically significant ($OR = 0.729 [\exp(-0.316)]; p < 0.01$).

[Inset Table 3.4 here]

I graphed the relationship between neighbourhood log income and labour market exit probability by occupation in Figure 3.3. It demonstrated that the U-relation between neighbourhood log income and labour market exit probability existed mainly in agricultural workers. Although the relationship between neighbourhood log income and labour market exit probability among non-agricultural employees was also curvilinear, there was a flattening in higher-income communities. In addition, an inverted U-curve appeared among self-employed workers. This may suggest that non-agricultural self-employed workers were more likely to exit the labour force when their neighbourhoods had a moderate level of socio-economic resources.

[Inset Figure 3.3 here]

Model 2 examined the interactions between household income, neighbourhood income and education. Household income level had a positive main effect on labour market exit probability (log odds = 0.132, $p < 0.01$), suggesting that older workers from higher-income families were more likely to withdraw from the labour force. The linear interaction term between neighbourhood log income and household income level was negatively associated with labour market probability (log odds = -0.066, $p < 0.05$). At the same time, the interaction between household income level and quadratic neighbourhood log income was also negatively associated with labour market probability (log odds = -0.030, $p < 0.1$).

According to Figure 3.4, the U-shaped curve was steeper in older workers from lower-income families. In contrast, the curve flattened as neighbourhood income increased after the mean level among older workers from higher-income families.

[Inset Figure 3.4 here]

3.4.4 Rural-Urban Disparities

I further examine geographic heterogeneity in the effects of neighbourhood socio-economic status on labour market exit probability. Results of rural-urban disparities in labour market behaviour are displayed in Figure 3.5. Concerning neighbourhood education, I found that rural men were more likely to withdraw from the labour force if they were from either low-education or high-education communities. Low-education neighbourhoods showed higher odds of labour market exit among rural women, whereas living in high-education neighbourhoods increased labour market exit probability among urban women. The confidence intervals of neighbourhood education's point estimates were wider among urban workers than rural workers.

[Inset Figure 3.5 here]

In rural areas, the quadratic relationship between neighbourhood income and labour market exit probability was positive for both men and women. In particular, it indicates a steeper U-shaped association between neighbourhood income and labour market exit among rural women. In urban areas, I only observed that neighbourhood income had a negative and linear relationship with labour market exit among urban men. It suggests that urban men are less likely to withdraw from the workforce as neighbourhood income increases.

3.5 Discussion

For decades, the role of neighbourhood contexts in retirement decisions has not been fully recognised. Drawing from neighbourhood effects literature, environmental gerontology, and life course theory, I examined the effects of neighbourhood socio-economic

(dis)advantages on labour market exit among older workers in China. The results showed evidence of non-negligible, non-linear relationships between neighbourhood education and income with labour force exit. Older workers were more likely to exit the labour force if their communities had relatively lower or higher levels of socio-economic resources. The U-shaped relationship between neighbourhood income and labour market exit probability was less evident among more advantaged older workers and could be reversed among non-agricultural self-employed adults. The findings provide new insights into retirement in neighbourhood contexts and have key implications for future policy-making and service development.

3.5.1 Understanding Labour Market Exit in Neighbourhood Contexts

This study supports Hypothesis 1, which anticipates a non-linear relationship between neighbourhood socio-economic status and late-career disengagement. In literature, some researchers have noticed that the relationship between socio-economic status and older adults' labour supply (Giles et al., 2011, 2023) as well as retirement (Fisher et al., 2016) may be non-linear. However, the scattered evidence has predominantly centred on individual levels rather than neighbourhood contexts. The findings indicate that the overall association between neighbourhood socio-economic status and labour market exit is U-shaped because older workers in more deprived or more affluent communities may be more likely to leave their jobs, while those in communities with moderate-level socio-economic resources tend to stay in the workforce longer. Possible explanations for this phenomenon are related to opportunity structures for work and retirement. On the one hand, older workers would expect better retirement security and be affected by retirement norms in affluent neighbourhoods. Older workers may be incentivised to withdraw from the labour force by China's pension and retirement policies (Giles et al., 2023), although residents in better-off neighbourhoods have a lower unemployment risk. Neighbourhood socio-economic resources can motivate older workers to engage in retirement preparations, for example, discussing retirement-related information with family mem-

bers, neighbours, and friends in the community. Consequently, leisure goals in retirement can be another pull factor encouraging older workers to withdraw from the workplace. On the other hand, neighbourhood deprivation restricts economic opportunities, pushing older workers out of the labour market. Individuals are embedded in their local communities (Mitchell et al., 2001), which may shape career pathways over the life course and the opportunity structure during retirement transitions. In deprived neighbourhoods, interaction with inactive or unemployed neighbours can reduce older workers' labour market attachment (for example, Manley & van Ham, 2012). Moreover, disadvantaged neighbourhoods may hinder older people's health capability for work. Much evidence has shown that neighbourhood socio-economic disadvantages are a key risk factor for various health problems (Diez Roux & Mair, 2010), especially in middle-adulthood (Menec et al., 2010). In low-income disadvantaged neighbourhoods, the lack of healthcare services and low levels of health literacy could elevate the health burden, which may force older workers to quit the workforce early. Another plausible explanation may be related to family duties. Residents in resource-poor communities may be more likely to rely on family support. Some older adults may strategically invest more time in unpaid care activities to seek future financial support from family members, especially children, because their cost of workforce withdrawal (or job exit) is usually lower in disadvantaged neighbourhoods.

I also found that neighbourhood education and income had non-linear relationships with labour market exit. The results are not surprising in light of existing research that has recognised the non-linear, threshold neighbourhood effects (G. C. Galster, 2018). Because education and income are two interrelated components of socio-economic sources, the findings confirm that the non-linear neighbourhood effects are unlikely to be artefacts. The principal implication for future research is that a combination of education and income may capture the neighbourhood effects on labour market behaviours better than single indicators. For policymakers, more efforts can be devoted to encouraging older residents from advantaged neighbourhoods to prolong their working lives while tackling neighbourhood socio-economic deprivation to improve the employability and workforce participation of disadvantaged older workers.

3.5.2 The Moderating Roles of Individual and Family Resources

The associations between neighbourhood socio-economic status and labour market exit behaviour depend on individual and household resources. Concerning occupation status, I found that the U-shaped relation between neighbourhood income and labour market exit was more evident among agricultural workers, offering support to Hypothesis 2. The relationship between neighbourhood income and labour market exit was flattened among non-agricultural employees, suggesting that only non-agricultural employees from low-income neighbourhoods were more likely to exit the labour force. At the same time, I observed that the relationship between neighbourhood income and labour market exit reversed among self-employed workers in non-agricultural sectors. Self-employed non-farm workers may be more likely to stay in the labour force when their neighbourhoods afford few or excessive economic opportunities. Because traditional retirement regimes restrain self-employed workers less, they may continue their business to cope with adverse local economic situations or to exploit potential entrepreneurial opportunities. The distinct neighbourhood effects on retirement decisions provide implications for future research that paying more attention to the interplay between occupation and neighbourhood contexts may yield valuable discoveries when theorising retirement decision-making.

In addition, Hypothesis 3, assuming that household income also moderates the relationships between neighbourhood income and labour market exit, receives empirical support. A U-shaped relation between neighbourhood income and labour market exit was steeper when the household earning capability was low. A reasonable explanation may be that low-income families rely heavily on their neighbourhoods for information and resources. In deprived neighbourhoods, these older workers may be subject to employment discrimination due to the lack of skill accumulation and low-quality employment information. In wealthier neighbourhoods, older workers with inferior backgrounds choose to retire early, whereby they can enjoy later-life protection offered by their communities. Nonetheless, they may engage in productive activities other than paid work, such as caring for grandchildren.

Comparing households, I observed that participants from lower-income families had

more significant changes in employment status than their affluent counterparts when living in more deprived or wealthy neighbourhoods. Although low-income neighbourhoods reduced the labour market attachment of inhabitants from different household income groups, the findings resonate with the debates about deprivation amplification (Macintyre, 2007) that neighbourhood deprivation can be compounded with family disadvantages. The negative effect of neighbourhood socio-economic disadvantages on later-life employment will be stronger among inhabitants from poorer households. As community income increases above the threshold, the retirement probability of older workers with a lower family income increases steadily, whereas the probability of labour market exit among older workers from better-off families remains generally stable. In line with the environment docility hypothesis (Lawton & Simon, 1968), it indicates that disadvantaged older workers may be more sensitive to the neighbourhood economy, which leads to increased differentiation of retirement routes in higher-income neighbourhoods. Overall, family resources can also buffer the neighbourhood income effects on labour market exit. Public support programmes that seek to reduce community poverty rates could provide more financial assistance to low-income, older households. Increased family economic conditions can boost older workers' independence and autonomy in neighbourhoods, enhancing productive lifestyles in later adulthood.

I did not find evidence supporting the moderating roles of individual and family resources in neighbourhood education effects on retirement. Neighbourhood education signifies the average human capital stock in the community, which can directly affect labour market prospects among older workers. Because residents have to exploit their social networks with neighbours and peers in the community, the effect of neighbourhood education on labour market exit behaviour may be more exogenous and differ minimally between workers of diverse backgrounds. I add to the literature (Giles et al., 2011, 2023) by suggesting that neighbourhood demographic composition can play a more nuanced role in shaping retirement decisions. The findings have important implications for policy-making that retirement reforms should transcend a worker-based perspective by considering the spatial and demographic dimensions. More specifically, local govern-

ments can deliver employment services and incentives to both high- and low-education neighbourhoods to reduce early exit intention and recharge older workers.

3.5.3 Geographic Variations in Labour Market Exit

The findings showed geographic variations in the non-linear relationships between neighbourhood socio-economic status and labour market exit. In line with Hypothesis 4, the U-shaped link between neighbourhood socio-economic status and labour market exit probability mainly emerged among rural workers. Older workers in rural areas tend to work labour-intensive, low-income jobs, such as farm jobs, and, consequently, may be more sensitive to neighbourhood economic conditions. The U-shaped curve of neighbourhood income effect on retirement was found in rural women, showing that rural women may retire early when their communities have fewer or more socio-economic resources. Because rural Chinese women often play a primary role in family caregiving, their workforce non-participation represents an adaptive family strategy (Moen & Wethington, 1992) that fulfils their family's needs. The strong non-linear effect of neighbourhood socio-economic status, especially neighbourhood income, on rural residents' labour supply suggests that public policies should attend to rural residents' varying needs in different communities. Special employment-based support, such as job training, should be provided to older workers residing in deprived rural neighbourhoods to promote their economic well-being.

Notwithstanding the urban-rural gap, the empirical findings further identified nuances that urban women in better-education neighbourhoods were more likely to exit the labour force whereas urban men in higher-income neighbourhoods had a lower probability of labour market exit. Given that China's pension system discourages older women from employment (K. Feng, 2023), these urban women workers may have a stronger intention to retire early, especially when they frequently interact with better-educated peers. Although older male workers in urban areas are also pulled toward retirement, a vibrant neighbourhood economy may provide additional, high-quality employment opportunities, motivating them to stay in the labour market.

3.5.4 Limitations

This study uncovered a non-linear relationship between neighbourhood socio-economic status and labour market behaviours in late careers. Nonetheless, readers should be aware of the limitations of this research when interpreting the findings. First, the information on neighbourhood education and income was only collected at the baseline survey and thus cannot account for the drastic neighbourhood change. Over the past decade, China implemented massive-scale poverty relief projects and allocated huge investments in community development across the country. These policy interventions may have significant influences on employment rates in lower-income communities. I urge future studies to treat neighbourhood socio-economic contexts as time-varying factors and exploit existing or ongoing natural experiments to examine the longitudinal, causal neighbourhood effects on retirement. Because community informants may undervalue neighbourhood per capita income, it would be necessary for future researchers to evaluate neighbourhood socio-economic environments using locally aggregated measures or alternative neighbourhood indicators.

Second, I did not distinguish labour market exit routes among older workers. Older workers from more deprived neighbourhoods may have a higher risk of job loss and some even re-enter the workforce after short-term inactivity. A deeper inquiry into late-career pathways among older workers in resource-poor communities is valuable and can be achieved by fellow researchers in the future. Lastly, this study did not explore potential indirect mechanisms between neighbourhood socio-economic resources and labour market behaviours. The neighbourhood effect literature suggests that various internal and external mechanisms, such as social interactions and area stigma, could explain the neighbourhood effects on employment (G. C. Galster, 2012). Future research can explore how these mechanisms contribute to the neighbourhood socio-economic effects on labour market behaviours among older workers.

3.5.5 Conclusions

In conclusion, this study contributed to the literature on labour market behaviours among older workers. Drawing from the neighbourhood effect literature and relevant theories pinpointing the importance of thinking work and retirement in broader contexts, it examined the associations between neighbourhood socio-economic resources and late-career behaviour in China. By tracing a nationwide sample of older workers over a decade, I found that older workers from neighbourhoods with abundant or limited socio-economic resources had higher odds of leaving their jobs. The non-linear relation between neighbourhood income and labour market exit probability was verified, mainly in more disadvantaged older workers who were in agricultural self-employment and from lower-income households. Despite the higher labour market exit probability in older workers residing in more deprived neighbourhoods, older workers who held non-agricultural positions and from higher-income households were less affected by their neighbourhood's economic conditions. However, an inverted-U link between neighbourhood income and labour market exit probability was found among self-employed workers in non-agricultural sectors. I further revealed geographic disparities that the U-shaped relations between neighbourhood socio-economic status and labour market exit probability existed primarily among rural residents, but urban men and women workers responded differently to neighbourhood socio-economic status.

In addition to differential exposure to neighbourhood socio-economic (dis)advantages, the place can also affect individual life chances through differential reception (Browning et al., 2016). One of the understudied yet noteworthy issues in retirement decision-making is older migrants' retirement. Henkens et al. (2018) suggest that the retirement opportunity structure for native residents and older migrants may differ substantially due to migration selection, labour market discrimination, as well as institutional barriers. Given the massive internal migration in China, it remains unanswered whether residential mobility may lead to divergent retirement behaviours. The next chapter will examine whether and how internal migration affects bridge employment among older Chinese adults. It will also complement Chapters 2 and 3 by showing how economic opportunity

and welfare contexts over the migratory life course differentiate late working lives among older migrants and non-migrants.

Table 3.1. Descriptive characteristics of older workers and their communities at baseline.

Variable	M(SD) / N(%)
Baseline workers	5125 (100%)
Age, mean (SD)	58.68 (4.41)
Sex (Male=1)	2647 (51.65%)
Education	
Illiterate	1508 (29.42%)
Primary school	2384 (46.52%)
Junior high school	804 (15.69%)
Senior high school or above	429 (8.37%)
Marital status (Married=1)	4757 (92.82%)
Household registration location (Another community=1)	393 (7.67%)
Baseline occupation	
Agricultural work	3520 (68.68%)
Non-agricultural employment	1168 (22.79%)
Non-agricultural self-employment	437 (8.53%)
Household income level, mean (SD)	2.95 (1.38)
Community	427 (100%)
Community education	
Low-education	100 (23.42%)
Average-education	160 (37.47%)
High-education	167 (39.11%)
Neighbourhood log income, mean (SD)	8.11 (0.99)
Neighbourhood log income, mean (SD)	0.10 (0.99)
Neighbourhood log income ² , mean (SD)	0.99 (1.48)
Area type (Urban area=1)	191 (44.73%)
Longitude, mean (SD)	113.49 (6.85)
Latitude, mean (SD)	32.42 (6.32)

Table 3.2. Trends in labour market exit in follow-up waves, stratified by sex and area type.

Sample	Level	Baseline	Wave 2	Wave 3	Wave 4	Wave 5
	Year	2011	2013	2015	2018	2020
Total	<i>N</i>	5125	4780	4707	4537	4479
	Working	5125 (100.00%)	3935 (82.32%)	3633 (77.18%)	3310 (72.96%)	3188 (71.18%)
	Labour market exit	-	845 (17.68%)	1074 (22.82%)	1227 (27.04%)	1291 (28.82%)
Female	<i>n</i>	2478	2319	2298	2267	2247
	Working	2478 (100.00%)	1866 (80.47%)	1705 (74.19%)	1600 (70.58%)	1585 (70.54%)
	Labour market exit	-	453 (19.53%)	593 (25.81%)	667 (29.42%)	662 (29.46%)
Male	<i>n</i>	2647	2461	2409	2270	2232
	Working	2647 (100.00%)	2069 (84.07%)	1928 (80.03%)	1710 (75.33%)	1603 (71.82%)
	Labour market exit	-	392 (15.93%)	481 (19.97%)	560 (24.67%)	629 (28.18%)
Rural	<i>n</i>	3692	3491	3460	3325	3272
	Working	3692 (100.00%)	2960 (84.79%)	2778 (80.29%)	2568 (77.23%)	2464 (75.31%)
	Labour market exit	-	531 (15.21%)	682 (19.71%)	757 (22.77%)	808 (24.69%)
Urban	<i>n</i>	1433	1289	1247	1212	1207
	Working	1433 (100.00%)	975 (75.64%)	855 (68.56%)	742 (61.22%)	724 (59.98%)
	Labour market exit	-	314 (24.36%)	392 (31.44%)	470 (38.78%)	483 (40.02%)

Table 3.3. Multilevel logistic regression models of labor force exit on neighbourhood socio-economic contexts.

	Model 1	Model 2	Model 3
Neighbourhood education (Ref.: Average-education)			
Low-education	0.425*** (0.127)	0.417*** (0.111)	0.445*** (0.113)
High-education	0.785*** (0.135)	0.315* (0.127)	0.339** (0.130)
Neighbourhood income			
Neighbourhood log income	0.107+ (0.062)	-0.034 (0.059)	-0.036 (0.061)
Neighbourhood log income ²	0.116** (0.042)	0.084* (0.040)	0.079+ (0.042)
Community characteristics			
Area type (Urban area=1)		1.019*** (0.122)	1.082*** (0.133)
Longitude		0.022* (0.009)	0.022* (0.009)
Latitude		0.026** (0.009)	0.029** (0.009)
Demographic characteristics			
Age			0.106*** (0.010)
Sex (Male=1)			-0.751*** (0.089)
Education (Ref.: Illiterate)			
Primary school			-0.052 (0.087)
Junior high school			0.040 (0.116)
Senior high school or above			0.226 (0.155)

Marital status (Married=1)			-0.710*** (0.104)
Household registration location (Another community=1)			0.298* (0.132)
Individual occupation (Ref.: Agricultural work)			
Non-agricultural employment			0.126 (0.105)
Non-agricultural self-employment			-0.005 (0.145)
Household income level			0.108*** (0.030)
Constant	-2.040*** (0.088)	-5.488*** (0.887)	-12.088*** (1.106)
<hr/>			
var(community)	0.645*** (0.094)	0.420*** (0.067)	0.440*** (0.074)
var(person)	2.683*** (0.162)	2.663*** (0.161)	2.653*** (0.166)
<hr/>			
Observations	18503	18503	18503
Community	427	427	427
Log likelihood	-9135.237	-9087.097	-8803.839
Wald chi ²	58.349	153.517	439.846
<i>p</i>	0.000	0.000	0.000

Notes: Log odds are reported. Clustered robust standard errors in parentheses. Model 3 also included survey wave fixed effects.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.4. Interaction between individual occupation, household income and neighbourhood socio-economic contexts (Multilevel logistic regression models).

	Model 1	Model 2
	Individual occupation	Household income
Neighbourhood education (Ref.: Average-education)		
Low education	0.471*** (0.123)	0.451*** (0.113)
High-education	0.282+ (0.150)	0.352** (0.130)
Neighbourhood income		
Neighbourhood log income	0.058 (0.065)	-0.016 (0.060)
Neighbourhood log income ²	0.148*** (0.041)	0.093* (0.042)
Individual occupation (Ref.: Agricultural work)		
Non-agricultural employment	0.188 (0.163)	0.135 (0.105)
Non-agricultural self-employment	0.286 (0.232)	0.001 (0.144)
Household income level		
	0.110*** (0.030)	0.132** (0.044)
Interaction terms		
Non-agricultural employment × Low-education	0.011 (0.251)	
Non-agricultural employment × High-education	0.100 (0.221)	
Non-agricultural self-employment × Low-education	-0.391 (0.372)	
Non-agricultural self-employment × High-education	0.270 (0.314)	
Non-agricultural employment × Neighbourhood log income	-0.173+	

	(0.100)	
Non-agricultural self-employment \times Neighbourhood log income	-0.252 ⁺	
	(0.139)	
Non-agricultural employment \times Neighbourhood log income ²	-0.092	
	(0.069)	
Non-agricultural self-employment \times Neighbourhood log income ²	-0.316**	
	(0.101)	
Household income level \times Low-education		0.086
		(0.069)
Household income level \times High-education		-0.057
		(0.066)
Neighbourhood log income \times Household income level		-0.066*
		(0.028)
Neighbourhood log income ² \times Household income level		-0.030 ⁺
		(0.017)
Community characteristics	Yes	Yes
Demographic characteristics	Yes	Yes
Survey wave	Yes	Yes
		(0.017)
Constant	-11.745***	-11.664***
	(1.088)	(1.113)
var(community)	0.411***	0.438***
	(0.071)	(0.075)
var(person)	2.647***	2.647***
	(0.164)	(0.166)
Observations	18503	18503
Community	427	427
Log likelihood	-8795.384	-8797.734
Wald chi ²	462.856	452.653
<i>p</i>	0.000	0.000

Notes: Log odds are reported. Clustered robust standard errors in parentheses. All models controlled for area type, longitude, latitude, age, sex, education, marital status, household

registration location, and survey wave fixed effects.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

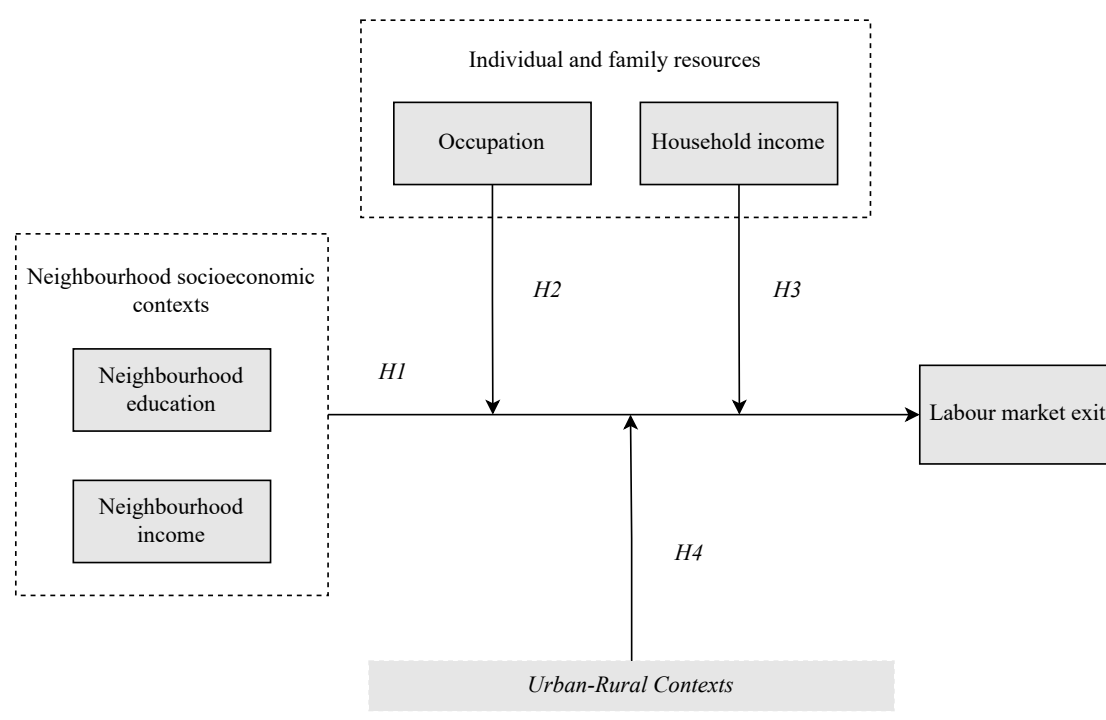


Figure 3.1. Schematic illustration of conceptual framework linking neighbourhood socioeconomic context and labour market behaviour in late adulthood.

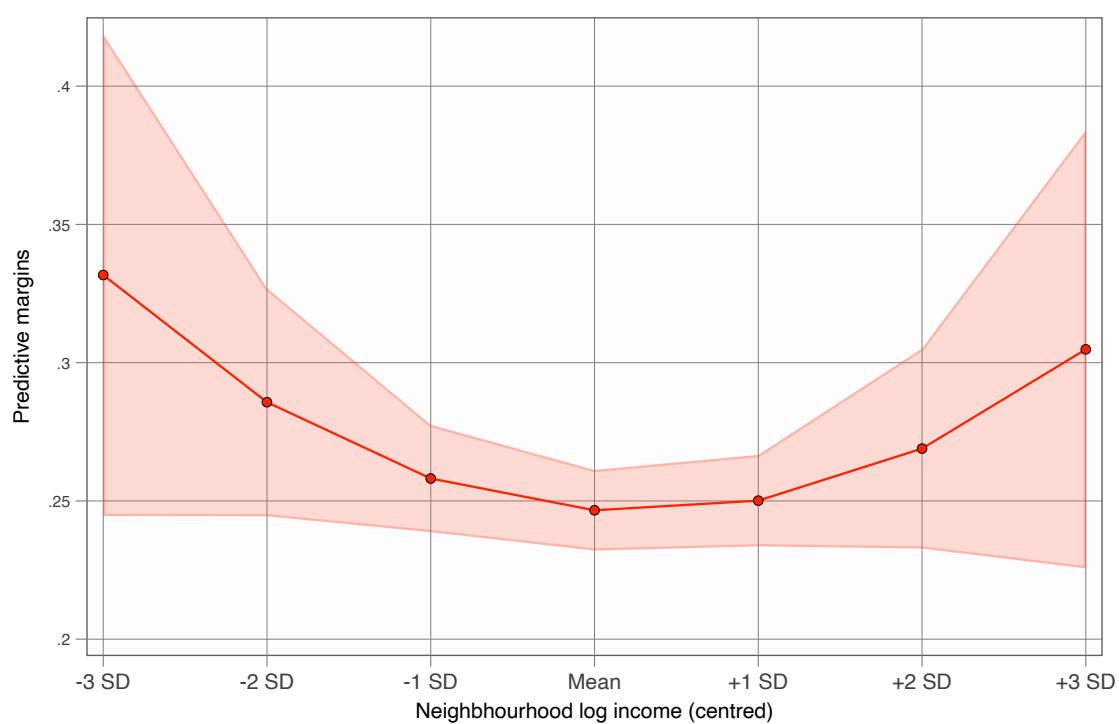


Figure 3.2. Predicted margins and 95% confidence intervals of neighbourhood income on labour market exit probability. Results were based on Model 3 in Table 3.3.

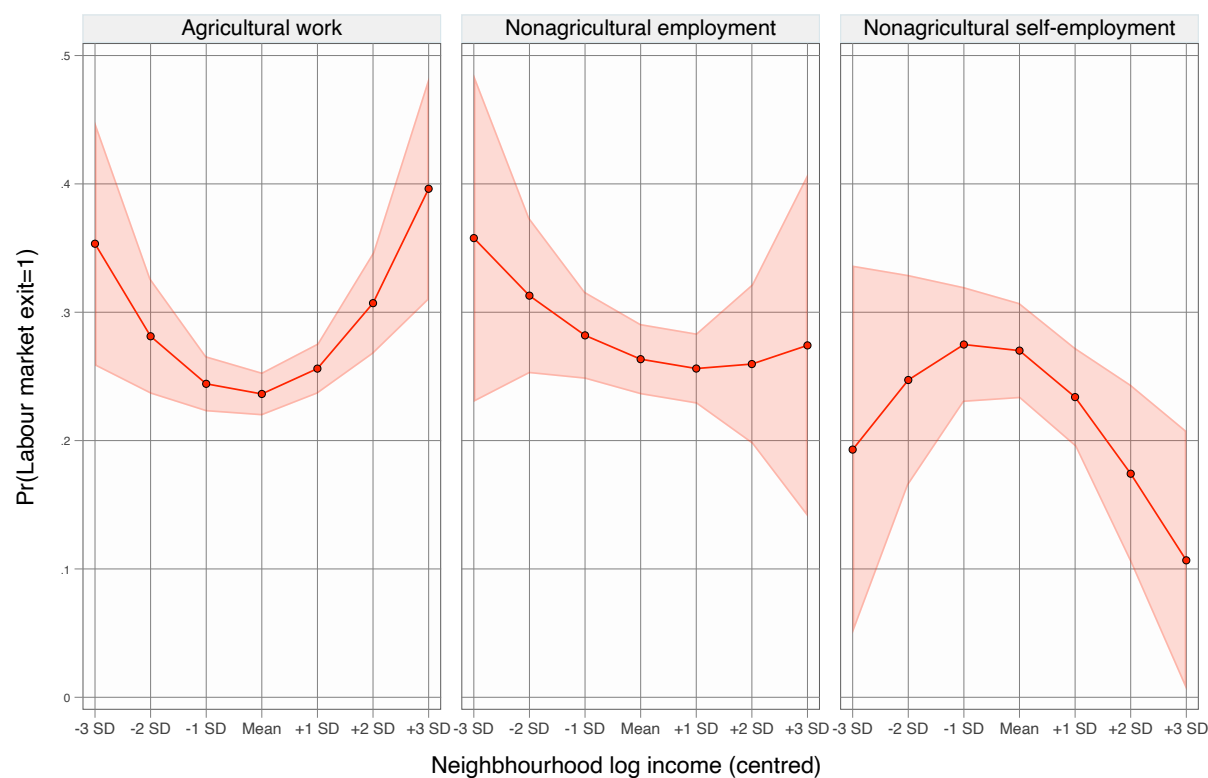


Figure 3.3. Predicted margins and 95% confidence intervals of neighbourhood income and occupation on labour market exit probability.

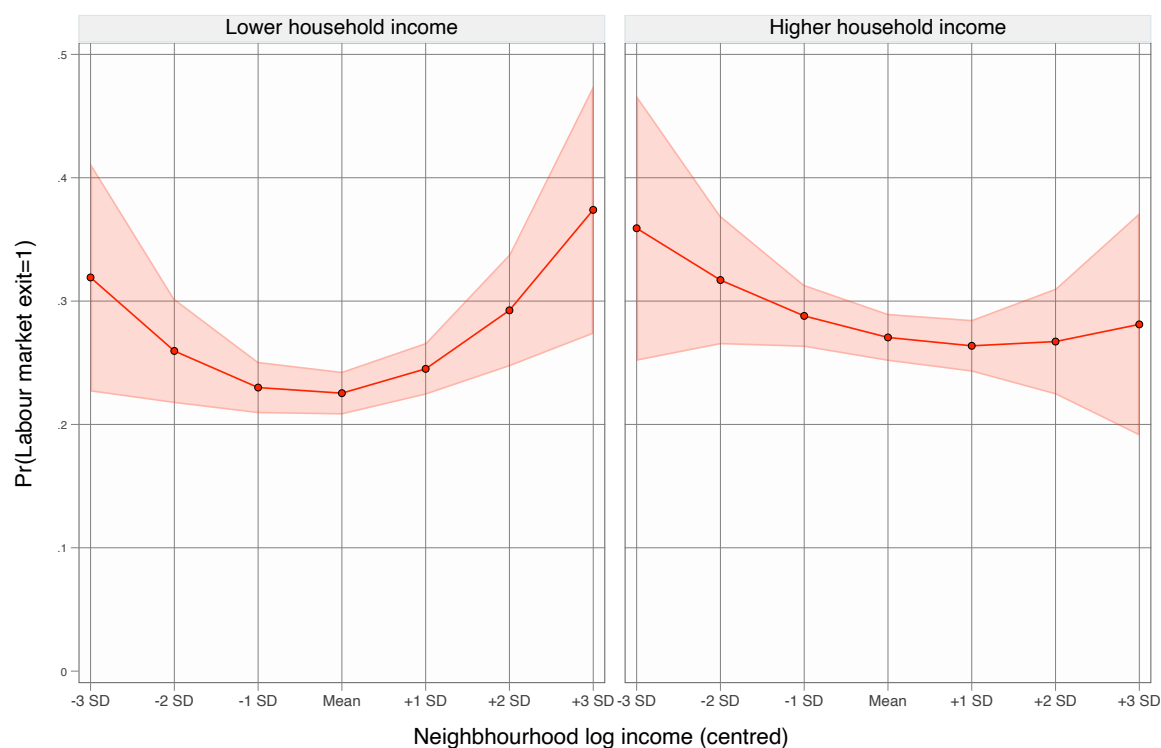


Figure 3.4. Predicted margins and 95% confidence intervals of neighbourhood and household income on labour market exit probability.

Note: Lower household income was defined as mean household income level minus 1 standard deviation, and higher household income was mean household income level plus 1 standard deviation.

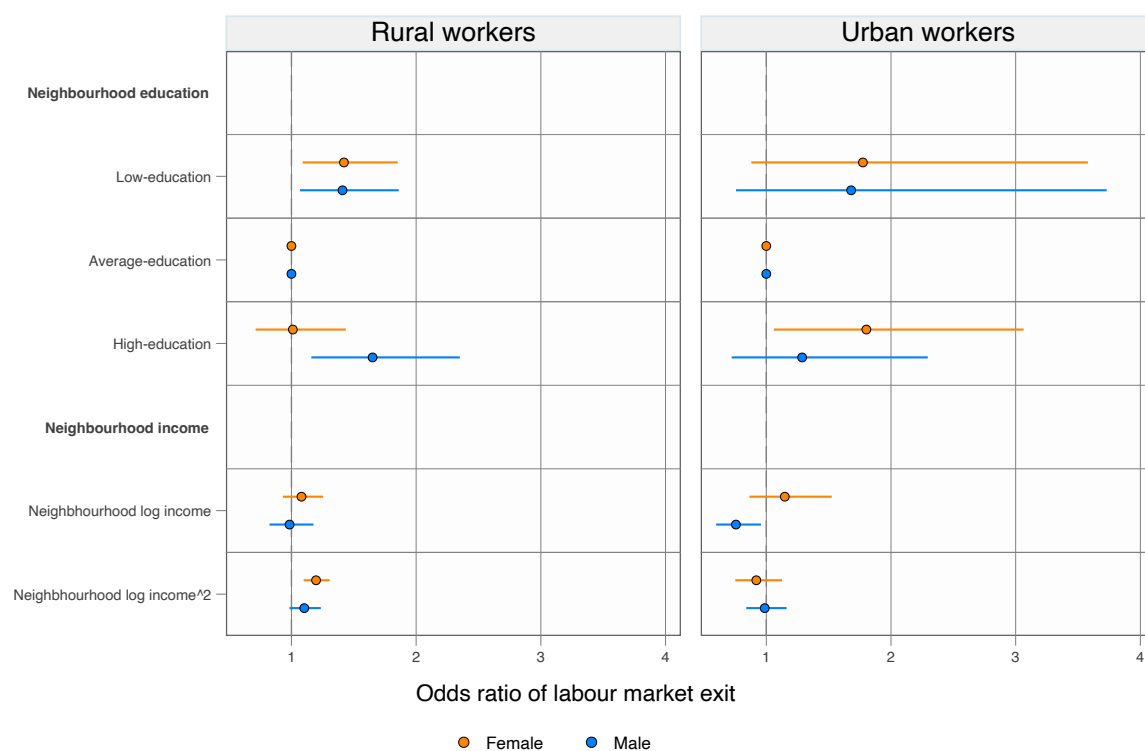


Figure 3.5. Odds ratios and 95% confidence intervals of labour market exit in urban and rural areas.

Chapter 4

Internal Migration and Employment after Pension Age

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Internal Migration and Employment after Pension Age: Do Movers Stay in China' s Ageing Workforce?

Abstract: The world is more mobile yet older than ever before, particularly in developing societies like China. However, the long-term impacts of internal migration on extended working life—paid work beyond pension ages—remain uncertain. Drawing from retirement and migration scholarship, this research proposes a conceptual framework that links internal migration history and employment after pensionable age while pinpointing the economic opportunity and welfare exclusion mechanisms underpinning older migrants' late-career decisions. Analyses of residential history and prospective survey data from the China Health and Retirement Longitudinal Study during 2011—2020 showed that migrants had lower odds of employment after pension age than non-migrants from the same place of origin, but rural-origin migrants were more likely than urban-origin migrants to extend their working lives. Migrants who moved in the post-reform era, crossed provincial borders, and stayed in urban destinations for more extended periods might have better economic preparation for retirement and thus were less likely to work after pension ages. Because of welfare exclusion, migrants who returned to their originating places or did not obtain an urban citizenship status had higher odds of prolonging their working lives. The findings indicate that advantaged migrants have better retirement security while migrants from less developed areas may stay in the ageing workforce longer.

Keywords: Economic opportunity; Extended working life, Internal migration; Life course; Older workers; Welfare exclusion

Introduction

Migrant workers are viewed as vital human resources for addressing the shrinking workforce due to population ageing (Harper, 2014; Marois et al., 2020), yet a deeper reflection of how migration interacts with ageing is lacking. Worldwide, lifetime migration has increased substantially both between and within countries (Abel & Sander, 2014; Bell & Charles-Edwards, 2013). Although media attention focuses mostly on international

migration, the second one presents an equally important demographic phenomenon as already one in five people moves across regions in their country (Charles-Edwards et al., 2019). The sheer magnitude of internal migration flows, notably rural-to-urban migration, in many low- and middle-income countries (LMCs) has contributed prominently to urbanisation and economic development over recent decades. For instance, China's internal migrant population ¹ has increased from 154.4 million to 375.8 million between 2010 and 2020 (National Bureau of Statistics of China, 2022). Internal migrants in countries like India and China also encounter considerable challenges in achieving integration in urban locales due to government-imposed restrictions (Selod & Shilpi, 2021). As migration often involves a significant change in social, economic, and welfare contexts, it constitutes a key life transition that may affect further career development and, probably, retirement decisions. Hence, this research aims to unpack the nexus between internal migration and late-career behaviour by looking at China, one of the most populous countries characterised by massive internal migration and remarkable workforce ageing.

The intricate impact of migration on individual life-course developments requires researchers to go beyond studying single migration events and consider migration biographies from a longitudinal perspective (Bailey, 2009; Halfacree & Boyle, 1993). Life courses of migrants are highly de-standardised and differentiated (Bernard & Kalemba, 2022), which can have implications for late-life transitions. However, the link between migratory life courses and retirement has received limited theoretical and empirical attention (Henkens et al., 2018). On the one hand, retirement research —drawing upon life course theory —often considers retirement decision-making in connection with career continuity (Han & Moen, 1999; Henretta, 2017), employment interruptions (e.g., Madero-Cabib et al., 2016; Raymo et al., 2011), or the impacts of major life events, such as grandparenthood (Kridahl, 2017). Yet, it tends to ignore the role of changes in places or locations where individuals work and live, especially internal migration. On the other hand, migration literature focuses on topics such as the employment outcomes of younger working-age migrants and second-generation migrants, and there is less interest in migrants' late ca-

¹This indicator does not include migrants moving between districts within a city. In China's official documents, these migrants are called "floating populations".

reers. For example, internal migration was linked to occupational outcomes among young adults in the US (Chetty & Hendren, 2018b), and middle-aged adults in Europe (Bernard, 2023) and China (Z. Chen et al., 2022). Only several qualitative studies considered how the migratory life course contours the meaning of post-retirement work (Karl & Ramos, 2015) and retirement security (Hepburn, 2020).

This study contributes to the literature by advancing the understanding of how migrants fare in later career stages. Specifically, we consider the linkage between internal migration and the likelihood of postponing retirement and working beyond pensionable ages. Employment after pension age, or bridge employment, is viewed as a non-standard retirement route that extends working lives and is becoming increasingly prevalent in older populations worldwide (Fideler, 2020; Gobeski & Beehr, 2009). Incorporating migration experiences as an important factor of employment after pension age enables this research to answer the question of how internal migration may differentiate later-life employment. We consider two central mechanisms in this process. First, we focus on the economic opportunity of internal migration by investigating whether the timing of migration, migration distance, and duration of stay that may benefit economic attainments affect employment. We argue that the economic benefits of migration can accumulate over the life course and ultimately offset the financial necessity of working beyond retirement age. Second, we consider the role of welfare regulations in shaping the employment decisions of internal migrants. Retirement systems mostly address individuals with stable career paths, e.g., with continuous employment within a single welfare context, often putting migrants with more complex occupational biographies in disadvantaged positions. This mostly refers to the institutional variations between countries, but can also be applied to fragmented welfare states, such as China. We argue that in response to the problems with welfare integration, internal migrants are more likely to insure themselves against retirement insecurity by working longer. Based on these two perspectives, we offered a fine-grained understanding of variations in retirement decisions not only between older non-migrants and migrants but also within migrant populations.

The role of internal migration for retirement is particularly important in non-Western

settings, such as in developing and ageing Asian societies where the magnitude and rate of internal migration flows, notably rural-to-urban migration, are growing markedly (Charles-Edwards et al., 2019). Thus, we study China using five waves of survey data and detailed life history information from the China Health and Retirement Longitudinal Study (CHARLS). After decades of policy interventions to control fertility, the country is not well prepared for its rapidly ageing population and millions of older workers born in the 1960s (“late boomer cohort”) who will retire in the following years. The formal retirement ages of 60 for males and 50/55 for women (blue- and white-collar, respectively) were established back in the 1950s and do not fit the current demographic challenges. As the data show, Chinese tend to work longer with the effective ages of labour market exit for men and women reaching 65.5 and 60.6 years in 2020 (OECD, 2021). However, the extension of working lives beyond the official pension ages appears to be unequally distributed between urban and rural regions because older people living in and moving from rural areas maintain higher employment rates than urban citizens (Giles et al., 2023; Q. Zhang & Wu, 2023), who may retire early or on-time with a more decent pension income due to mandatory retirement policies. The present research demonstrated that this disproportion could be attributed to the joint effects of internal migration, ageing, and welfare contexts. The findings complement the current literature and policy debates by identifying which migrants may stay longer in the ageing workforce.

4.1 Institutional Setting

Accelerating population ageing and growing migration intensities are two major processes characterising China’s recent demographic dynamics. The implementation of the one-child policy (during 1979–2015) has unexpectedly turned China into perhaps the world’s fastest ageing country, with the old-age dependency ratio increasing from 9.9% in 2000 to 21.8% in 2022. Notably, the pace of gains in China’s life expectancy since the 1960s has surpassed many industrial (for example, Japan) and developing countries, with life expectancy at age 60 reaching 19.5 years in men and 23.8 years in women in 2021

(<https://data.worldbank.org>).

Meanwhile, China's migration landscape has remarkably evolved in recent decades. During China's socialist period (1950s–1970s), people were strictly confined in their place of origin owing to the household registration system, namely hukou. Launched in 1958, the hukou system created a dual structure of China's workforce. Non-agricultural jobs were concentrated in urban areas and were allocated by the government through central planning. Rural residents engaged in farm jobs organised by rural communes and barred from urban labour markets. Migration rates were low in this period and major movements were primarily driven by natural disasters and political changes (Liang & White, 1996).

Internal migration flows increased in the 1980s after China had introduced policy reforms to promote a transition from the planned economy toward a market-based economy. The roll-out of the household responsibility system hammered rural communes and created an increasing number of surplus labourers in rural regions, and the establishment of special economic zones in coastal areas triggered enormous demands for young workers (Liang, 2016). The geographic imbalance of economic opportunities incentivised working-age people to move between regions. Millions of rural residents moved to urban areas and large cities (Xing & Zhang, 2017) and entered the informal and private sectors (Fan, 2002).

[Figure 4.1 here]

The last decade (2010s) marked a significant demographic and institutional shift in China's internal migration. The ageing of the labour force and the relocation of labour-intensive manufacturing factories (Cui et al., 2018) have led to a surge of returnees among first-generation migrants. With an elevated speed of urbanisation, small cities and towns attract numerous rural-origin migrants (Hao & Tang, 2018). A snapshot of China's internal migration populations in 2020 is shown in Figure 4.1. Despite huge migration flows to coastal regions, Figure 4.1 indicates that traditional major migration-sending provinces like Sichuan and Henan in western and central China are absorbing a growing magnitude of return migrants and intra-provincial migrants.

To meet the needs of the increasing number of floating populations, China has im-

plemented a series of policy reforms, for example, abolishing the traditional dual-hukou system, to boost the social and economic integration of migrants. However, the hukou system persistently restrains the equal provision of employment-related welfare (H. Wang et al., 2015) and deters the portability of pension rights across provinces (L. Zhang & Li, 2018) in China. Due to limited and unequal welfare protection, socio-economic integration is unlikely to be achieved by many rural-origin migrants (Y. Cai & Cheng, 2014). In later adulthood, financial needs may push these disadvantaged migrants to prolong their working lives (Q. Zhang & Wu, 2023).

4.2 Conceptual Framework

4.2.1 Theorising the Nexus between Internal Migration and Employment after Pension Age

Migration constitutes an important transition in one's life and career and can have critical repercussions for individual retirement preferences and opportunities (Lopez & Slavov, 2020). Migration is conceptualised as a rational and active action (Coulter et al., 2016) that seeks a better life, however, whether migrants' ambitions can be realised usually depends on a variety of factors, including timing, direction, economic integration, return decision, legal status, welfare context and many others (e.g., Aguila & Vega, 2017; Borjas, 2011; Z. Chen et al., 2022). Rather than a one-time event, migration is an element of a long-term trajectory, which involves changes in social roles and positions occupied by individuals (Stovel & Bolan, 2004), the accumulation of migration experience (Bernard & Perales, 2021), and a dynamic process of occupational mobility (Chiswick et al., 2005). The cumulative advantage perspective (DiPrete & Eirich, 2006) suggests that in the labour market, initial differences between migrants and non-migrants and between different migrant groups can be accentuated over the life course, leading to more differentiated employment behaviours in late careers.

Two mechanisms that may underpin the link between internal migration and later-life employment outcomes and retirement decisions are recognised, including economic

opportunity and welfare exclusion. *Economic opportunity* refers to the way and extent to which migration impacts career prospects and wealth accumulation. This economic process has been extensively examined in migration literature, mainly for considering economic stimuli and benefits of residential mobility (Bernard, 2023; Feldman & Ng, 2007; Greenwood, 2021; Reichelt & Abraham, 2017). For example, migrants tend to move to regions with better job opportunities and higher incomes (Kennan & Walker, 2011). For migrant workers, the quality of career offers long-term incentives for their future retirement. Older workers in orderly and advantaged careers can better plan and control their exit from employment (Turek & Henkens, 2024). Consequently, migrant workers who benefit from improved economic opportunities may opt for a complete retirement.

The second theoretical mechanism relates to *welfare exclusion*, which is described as the lack of equal participation in social welfare programmes of citizens (Burchardt et al., 1999). Numerous border- or region-based welfare states rely on the differential governance of social welfare rights that provide migrants from disadvantaged backgrounds with comparatively limited social protection, creating a “hierarchy of citizenship” (Castles, 2005). Comparative studies have revealed that this welfare exclusion issue prevails in both developed regions like Europe and developing countries like China (Kovacheva et al., 2012; Pasquali, 2022). However, in some developing countries, the responsibilities of providing social services and welfare are more decentralised to local governments. In China, social insurance policies are dictated by provincial or municipal governments with considerable discretion (Y. Cai & Cheng, 2014; L. Zhang & Li, 2018). At the same time, the lack of integration between various pension systems has generated substantial differences in participation and entitlement between employees of different establishments and residents and between urban and rural areas (Zhu & Walker, 2018). Migrants who are discriminated against by the welfare system may lack sufficient pension income and be at a higher poverty risk in later life. Consequently, welfare exclusion may force disadvantaged migrants to strive for economic well-being by working longer.

In this study, we make several key distinctions between internal migrants. First, we will compare lifetime migrants with non-migrants in the same originating area and

across places. Within the migrant population, key features of migration experiences that underlie economic opportunity are the migration timing, the distance of migration, and the duration of urban residence while return decisions and legal status can induce changes in migrants' welfare situations. Drawing from economic and welfare mechanisms, we will develop hypotheses about how internal migration history affects post-retirement employment below.

4.2.2 Economic Opportunity Mechanism

The migration literature asserts that migration decision involves deliberate calculations of possible benefits and costs (Jia et al., 2023; Sjaastad, 1962; Todaro, 1980). This is because migrating to a new place often entails potentially high costs of moving because of the lack of sufficient information and location-specific resources (DaVanzo & Morrison, 1981), the "psychic costs" (Sjaastad, 1962) of adapting to unfamiliar environments, and the cost of living (Molloy et al., 2011; Todaro, 1980). In this sense, migration events occur when individuals anticipate returns higher than costs. On the one hand, people moving out of their hometowns are often endowed with more social resources and human capital (Garip, 2008; Young, 2013) to cope with the costs of migration than non-migrants. On the other hand, from a job search and matching perspective (Kennan & Walker, 2011), migration enables individuals to circumvent unfavourable labour market conditions in their home regions by moving to an alternative location with the highest income prospect. As a result, migration usually benefits employment outcomes (Greenwood, 2021; Mulder & van Ham, 2005).

Given that employment income constitutes the predominant source of old-age financial support for older adults in East and Southeast Asian areas (O'Keefe et al., 2021), improved economic well-being can reduce migrants' reliance on later-life labour income, leading to lower employment rates than their non-migrant counterparts. From the economic opportunity perspective, we expect that internal migration is negatively associated with employment after pension age.

Hypothesis 1: *Migrants have lower odds of employment after pension age than non-*

migrants in the same place of origin.

For migrant populations, it is important to identify migrants based on their places of origin (Ebenstein & Zhao, 2015). Especially in countries with a modest or moderate degree of urbanisation, rural-origin migrants represent the largest migration flow while urban-origin migrants have a smaller scale. However, persistent urban-rural gaps may differentiate adulthood career paths and retirement preparations between migrants of different origins. Migrants from rural and urban households differ significantly in their human capital endowment (Lagakos, 2020). In the segmented labour market, rural-origin migrants often concentrate in informal sectors and low-skilled jobs (Fan, 2002) and change employers frequently (Ou & Kondo, 2013). In contrast, urban-born citizens have more individual and family socio-economic resources before migration and tend to be positively selected in the labour market. Evidence has shown that urban-origin migrants have a high proclivity to move between skill-intensive urban sectors and can gain access to higher-status and non-manual occupations in China (X. Wu & Treiman, 2007; Young, 2013). Lacking a stable career trajectory and employment security can hamper rural-origin migrants' retirement preparations and increase their dependence on labour income after retirement. Taking together, we hypothesise that rural-origin migrants are more likely to continue to work than urban-origin migrants.

Hypothesis 2: Rural-origin migrants have higher odds of employment after pension age than urban-origin migrants.

The economic opportunity mechanism indicates that moving at a proper time is crucial. Socio-economic development can gradually bridge gaps between urban and rural areas (Lagakos, 2020) and alter the attractiveness of places, leading to periodic changes in migration rates as well as destination choices. Historically, economic opportunities for migration in China were highly restricted before the market transition. Early migration in the socialist period might not have benefited career development because migration during the 1960s-1970s was detrimental to economic well-being among Chinese adults due to mobility involuntariness and life interruptions (Qian & Hodson, 2011). Besides, long-term economic and political turmoil also significantly damaged employment pension

systems in pre-reform periods. In the post-reform era, emerging economic opportunities constitute a major driver for migration because migrants flocked to regions with higher income levels and more foreign investment (Shen, 2012). We hypothesise that migrants who migrated in post-reform periods can prepare for their retirement better and are less likely to engage in the ageing workforce than pre-reform migrants.

Hypothesis 3: *Migrants who moved in post-reform periods have lower odds of employment after pension age than migrants who moved in the pre-reform era.*

Migration costs and opportunities vary by the distance of migration. Long-distance migration, such as inter-regional migration, is more costly than short-distance migration within the originating province or state (Molloy et al., 2011). Consequently, economic pull factors at the destination play a prominent role in long-distance migration decisions. Evidence has shown that migrants driven by high economic motivations for education and employment are more likely to make long-distance moves while short-distance migrations are often related to non-work reasons (Thomas et al., 2019). Because managing new employment and social relationships in unfamiliar places can be challenging, people who move to other provinces or regions, especially top-tier cities, have more individual employment-related resources and capabilities and can gain more economic rewards than short-distance movers. Over the long term, long-distance migration may accumulate more savings for retirement than short-distance migration. We expect that inter-provincial migration may be negatively associated with employment after pension ages.

Hypothesis 4: *Inter-provincial migration is associated with lower odds of employment after pension age.*

It is further argued that people who moved to metropolitan areas, known as “escalator regions” (Fielding, 1992), may achieve greater upward occupational mobility. Recent evidence from Europe and China adds that migrants living in urban areas typically outperform migrants in rural areas regarding socio-economic outcomes (Bernard, 2023; Z. Chen et al., 2022). Specifically, the economic benefits of moving to urban centres are more prominent among long-stay migrants. Research on migrant assimilation argues that migrants often experience a short-term decline in income and occupational status after

migration and gradually catch up with their non-migrant counterparts (Chiswick et al., 2005). A long-term stay in urban areas can enable migrants to achieve upward economic mobility (Chiswick et al., 2005; Qin et al., 2016) and boost social integration (Mai & Wang, 2022). Based on the economic opportunity mechanism, we expect that migrants with a longer period of urban settlement have more economic resources for retirement and are less likely to prolong their working lives.

Hypothesis 5: *Migrants who live in urban areas for a longer period have lower odds of employment after pension age.*

4.2.3 Welfare Exclusion Mechanism

Besides economic opportunity, differential access to welfare rights may also influence retirement decisions among migrants. For migrants, welfare issues may arise with return migration decisions. Typically, return migrants are disadvantaged groups characterised by older ages, rural origin, fewer socio-economic resources and more social considerations than non-return migrants (Lundholm, 2012; Nedomysl & Amcoff, 2011). Because migration is an investment, return migration may imply a considerable opportunity cost, such as losses in acquired welfare rights. Notably, mature return migrants need to cope with deteriorated retirement welfare situations, especially when a unified system is absent or bilateral agreements between regions are under constraints (Taha et al., 2015). In China, for example, moving from high-income provinces to low-income regions can lead to a decrease in pension benefits (L. Zhang & Li, 2018). Because of decreased retirement securities and persistent financial needs, migrants who returned to their place of birth were more likely to maintain engagement in both farm and non-farm work than continuing migrants, a phenomenon that can be observed in many Asian countries (H. Chen & Wang, 2019; Chunyu et al., 2013; Dhar & Bhagat, 2021). We hypothesise that return migration is positively associated with a longer working life.

Hypothesis 6: *Return migrants have higher odds of employment after pension age than continuing migrants.*

For migrants, legal status acquisition is a key step towards welfare integration. Mi-

grants with legal status at the destination are eligible for equal social security benefits such as pension (Kovacheva et al., 2012). However, obtaining legal citizenship can be challenging when facing persistent institutional barriers (Selod & Shilpi, 2021). Consequently, temporary migrants without permanent residence at the destination are often excluded from the host region’s social welfare system.

In China, citizenship rights are closely linked to the hukou system, which initially functioned as “a form of internal passport control” (Chan et al., 1999). A local non-agricultural hukou can offer its holders a wide range of high-quality social services and welfare such as housing and old-age pensions in urban areas. Migrants without urban citizenship, or temporary migrants, are at higher risk of being excluded from employment-based social insurance programmes (H. Wang et al., 2015; Q. Xu et al., 2011). Despite recent pension insurance coverage expansion, non-local rural migrants still face enormous welfare discrimination and are treated as outsiders in urban pension regimes (Yang, 2021). Yet, successful rural-to-urban hukou converters can achieve upward social mobility and have better life chances (X. Wu & Treiman, 2007). From the welfare exclusion perspective, we expect that older migrants with urban citizenship are less likely to depend on labour income because they have privileged welfare access than other migrants. Specifically, urban-origin migrants and permanent rural-to-urban migrants may be less likely to work longer than migrants without urban hukou status (either dwelling in urban or rural areas).

Hypothesis 7: Migrants with urban citizenship status have lower odds of employment after pension age than migrants without urban citizenship status.

4.3 Methods

4.3.1 Data and Sample

The CHARLS is a biennial cohort survey that collects data from a nationally representative sample of middle-aged and older adults in China. The baseline survey was conducted in 2011–2012 with 17,708 community-dwelling adults aged 45 or above. The sample was selected from 150 counties in 28 provinces using the multi-stage probability sampling

strategy and had an individual response rate of 80.5% (Zhao et al., 2014). Fieldwork was completed through computer-assisted face-to-face interviews. Follow-up surveys of the baseline sample were carried out every two or three years in 2013, 2015, 2018, and 2020. The CHARLS implemented a life history survey in 2014 to capture extensive information on residential histories, making it possible for researchers to explore life-course migration experiences.

This study used data from CHARLS 2011–2020 and the life history survey. The sample of this study was selected based on the following criteria: (a) baseline sample; (2) aged 50–79 at baseline; (3) participants in the life history survey. Among the 10,731 older participants, those who had never worked or did not report baseline employment status ($n = 457$), did not report valid information on residential history ($n = 2$), and moved internationally ($n = 85$) were excluded. We further excluded 151 participants who had missing data or did not participate in follow-up surveys. Eventually, we obtained an analytical sample of 10,036 older adults.

4.3.2 Measures

Employment after Pension Age

We measured employment after pension age based on employment status and pension eligibility (Dingemans et al., 2017). We first identified respondents who were receiving pension income or not. In China, pensioners refer to older people who regularly receive benefits from the following pension systems: the retirement pension for civil servants and employees of public institutions; the enterprise employee basic pension; the resident social pension plans; and other pension schemes (for example, commercial pensions). For pension recipients, employment status was determined based on the respondents' engagement in various wage or self-employed activities, including agricultural or non-agricultural employment, self-employment in family business, and agricultural self-employment. Employment after pension age was coded as 1 if the respondents had worked for at least one hour during the past week and 0 for not working pensioners, that is, full retirees.

Internal Migration

Internal migration is defined as inter-county residential mobility (Z. Chen et al., 2022). In the CHARLS life history survey, respondents were asked to list their previous residential places lasting six months or longer since birth and then provide information on each residence's location and the timing of moving in and out.

Lifetime Mobility. Lifetime migrants were defined as respondents who had ever migrated to other counties or cities for six months or longer before the baseline survey (yes versus no). As suggested by Ebenstein and Zhao (2015), origin-based methods could effectively estimate China's migration population, particularly rural-origin migrants. We therefore classified all the respondents into four groups based on their lifetime mobility status and places of origin/first residence: (1) rural-origin migrant, (2) urban-origin migrant, (3) rural stayer, and (4) urban stayer. The first two groups included people who had moved at least once, whereas the last two groups were those who stayed in their birthplace throughout their past lives.

Timing of Migration. The timing of initial migration was coded as a categorical variable according to China's economic reforms. The categories were: (1) moved in the pre-reform era (before 1978); (2) moved in the early reform period during 1978 and 1990; and (3) late migration, applicable to participants who migrated between 1991 and 2011.

Distance of Migration. By comparing the place of birth and first destination, we identified migrants who moved out of their original province. The variable was coded as 1 for inter-provincial migrants and 0 for migrants moving within their original province. Inter-provincial migration had a geographic distance on average longer than intra-provincial migration and was mostly driven by employment-related reasons like working away and military service in our sample.

The Duration of Urban Residence. We counted the duration of staying in urban destinations. The variable considered urban residences since the first migration and did not include the time spent in urban hometowns. The variable was collapsed into three categories: (1) less than 10 years; (2) 10–29 years; and (3) 30 or more years.

Return Migration. Return migrants were defined as migrants who returned to their

places of origin. Return migration was coded as 1 for migrants residing in their original county or city at baseline and 0 for continuing migrants staying in cities or provinces other than their places of birth.

Legal Status. Following Song and Smith (2019), we grouped all the respondents into four types: (1) rural hukouer; (2) urban hukouer; (3) permanent rural-to-urban migrant; and (4) temporary rural-to-urban migrant. Rural hukouers were migrants living in rural areas while holding agricultural hukou. Urban hukouers, likewise, were migrants who held a non-agricultural hukou since birth. The last two groups were comprised of rural-origin migrants residing in urban communities. Permanent migrants had converted their agricultural hukou into a non-agricultural hukou (urban hukou). Temporary rural-to-urban migrants included rural-born migrants staying in urban areas without an urban hukou. The classification of urban and rural regions followed the official standards of the National Bureau of Statistics of China (urban refers to city centres, towns or peri-urban areas while rural refers to villages).

Internal Migration Frequency. We controlled the number of migrations before the baseline survey because it may confound the relationships between economic opportunity, welfare access, and employment after pension age. The frequency of migration was a categorical variable (Bernard & Perales, 2021): (1) migrated once; (2) migrated twice; (3) migrated three or more times.

Demographics and Family Backgrounds

This study included the respondents' age, birth cohort (before 1940, 1940–1949, 1950–1959, and 1960–1964), sex, ethnicity (ethnic minority versus Han Chinese), marriage timing, parenthood, and education. Educational attainment was a categorical variable, including illiterate, primary school, junior high school, and senior high school or above. Marriage is a key proximate life event that affects internal migration behaviour (Bernard et al., 2014) and career trajectories. Marriage timing was coded as 1 if the respondents married before age 25 and 0 otherwise, according to Chinese migrants' timing of union formation (Bernard et al., 2014). To control for health status, we included physical dis-

ability (yes or no), measured by asking the respondents whether they had any difficulties in six basic activities in daily living (for example dressing).

In addition, we considered several family background factors that may affect internal migration decisions and labour market outcomes (Z. Chen et al., 2022; Chiang et al., 2015). Childhood family factors included parents' education (at least one literate parent or not), family's economic situation in childhood (from 1= very poor to 5 = better off), and geographic region (eastern China, central China, western China, and northeastern China). Parental employment in childhood was included and coded as dummy variables (0 = not working or self-employed in agricultural work, 1 = at least one parent having non-agricultural jobs).

4.3.3 Analytical Strategy

We first described the demographic and family characteristics of the baseline total sample and sub-samples by lifetime mobility status. The features of internal migration history were then profiled for the migrant sample. Employment rates were described by age and lifetime mobility status. Multilevel logistic modelling (MLM) with random intercepts was adopted to examine the associations between migration and employment after pension age (see Model specification in Supplementary material). In our data, observations (Level 1) were nested within persons (Level 2) because the average number of interviews for each person was 4.55. The MLM approach could account for person-year cluster structure by specifying a random intercept for each participant. Odds ratios (OR) and standard errors (SE) were reported.

The regression analyses were performed in two steps. Firstly, we investigated the differences in employment after pension age between lifetime migrants and stayers. The effects of lifetime mobility on employment were estimated in the total sample and sub-samples stratified by the place of origin, enabling this research to compare migrants and non-migrants both within and across the place of origin. Secondly, we examined the associations between various features of internal migration history and employment after pension age to test hypotheses derived from economic opportunity and welfare exclusion

mechanisms. Tests for multicollinearity using variance inflation factors (VIF) showed no severe collinearity issues in fully adjusted regression models (mean VIFs < 2).

The robustness of our results was checked in several ways. We performed additional analyses to examine how internal migration was associated with later-life economic well-being indexed by household income, wealth, and monthly pension income. Because China's retirement age policies are highly stratified by occupation, internal migration experiences may have stronger effects on employment decisions among older pensioners than younger groups or non-pensioners. We compared employment probabilities before and after pension ages and investigated the age heterogeneity in employment to illustrate how internal migration might differentially influence employment decisions in late adulthood. We then examined the potential interactions between hukou status, area of residence, and return migration to unpack the welfare mechanisms. To further assess the influence of migration selectivity, we employed the Heckman selection approach, which first estimated the probability of being a migrant and then examined employment status in another probit model controlling for sample selection bias using the inverse Mills' ratio (Heckman, 1979). Lastly, we utilised working hours to define employment status more strictly and check the sensitivity of the findings to alternative outcome measures.

4.4 Empirical Results

4.4.1 Descriptive Results

Table 4.1, column 1 presents the summary characteristics of our sample at baseline. The participants had a baseline mean age of 60.92 years ($SD = 7.11$), with half being males and 7.74% from ethnic minority groups. Table 4.1, columns 2 and 3 describe the characteristics of lifetime non-migrants and migrants. In the total sample, up to 30% of the participants had migrated to other counties at least once over their life course. The results of group comparisons in column 4 of Table 4.1 show that lifetime migrants were more likely to be raised in rural areas but had more family socio-economic resources, better education, and a delayed transition into marriage than lifetime non-migrants. In

their mid-later life, lifetime migrants were more likely to reside in urban areas and hold a non-agricultural hukou than non-migrants.

[Table 4.1 here]

Table 4.2 further profiles the internal migration history of lifetime migrants in our sample. Rural-origin migrants accounted for 85.2% of the migrant sample. The results show that one in five migrants (20.94%) moved three or more times in their lifetime. For the initial migration, a large proportion of migrants moved in the pre-reform periods, within their original provinces. Over the migratory life course, more than one in three migrants resided in urban destinations for 10 or more years, and 68.27% of migrants had already returned to their original city. Concerning legal status, 17.07% of migrants had acquired an urban hukou, and 15.26% were temporary rural-to-urban migrants.

[Table 4.2 here]

Figure 4.2 visualises the employment rates of lifetime migrants and non-migrants by age group and place of origin. It shows that in the same place of origin, migrants had lower employment rates than their non-migrant counterparts. In the early fifties, 83.6% of rural non-migrants and 77.0% of rural-origin migrants were working, but 68.6% of urban non-migrants and 57.6% of urban-origin migrants were working. Although later-life employment rates declined with age among all groups, urban-origin migrants demonstrated the fastest decline in employment rate between age 50 and age 65 than rural-origin migrants and non-migrants.

[Figure 4.2 here]

4.4.2 Modelling the Link between Lifetime Mobility and Employment after Pension Age

We then examined whether and how lifetime mobility was associated with employment after pension age using multilevel logistic models. Table 4.3 presents the estimated effect of lifetime mobility on employment in the entire pensioner sample (Model 1), rural-origin sample (Model 2), and urban-origin sample (Model 3). In Model 4, we compared the effect of lifetime mobility on employment between older migrants and non-migrants

across places of origin.

[Table 4.3 here]

Model 1 shows that lifetime migration was negatively associated with employment after pension age. Consistent with hypothesis 1, it suggests that internal migrants have 49 $[(1-0.510)\times 100]\%$ lower odds of employment after pension age than lifetime stayers. The odds ratios of employment among older migrants from rural and urban areas were 0.387 in Model 2 and 0.296 in Model 3, respectively, showing a consistent pattern that internal migration reduces the likelihood of employment extension after reaching pensionable ages.

Within the non-migrants, Model 4 shows that the odds of employment after pension age among rural stayers were 4.186 times higher than lifetime stayers in urban areas. Concerning migrants, rural-origin migrants had 1.626 times higher odds of employment than urban stayers whereas urban migrants had 74.8% lower odds of employment than urban stayers. The results support hypothesis 2 that rural-origin migrants are more likely to work after pension age than urban-origin migrants, who may opt for an earlier and more complete withdrawal from the workforce.

4.4.3 Internal Migration History and Employment after Pension Age

The results of multilevel logistic regression analyses of employment after pension age on a range of features of internal migration history are presented in Table 4.4. We first estimated the effect of internal migration features related to economic opportunity, including migration timing, migration distance, and duration of urban residence, in Model 1. To examine the relationships between welfare exclusion and employment after pension age, return migration and legal status were included in Model 2.

[Table 4.4 here]

As shown in Model 1, people who migrated in post-reform periods had lower odds of employment after pension age than migrants who moved in pre-reform periods. In Model 2, the odds ratio of employment for migration in the early reform era was 0.587

and statistically meaningful, suggesting that migrants who moved between 1978 and 1990 were 41.3% less likely to work beyond pension age. Migration in the later post-reform period was also associated with 30.7% lower odds of employment. In line with hypothesis 3, the results suggest that older migrants who moved in post-reform periods are less likely to work after pension age.

The effect of inter-provincial migration on employment after pension age was negative in Model 1, suggesting that migrants who moved between provinces had 30.5% lower odds of employment after pension age than intra-provincial migrants. The effect of inter-provincial migration was slightly attenuated but remained meaningful after accounting for welfare contexts in Model 2. Overall, hypothesis 4, which assumes a negative relationship between inter-provincial migration and employment after pension age, is supported.

Our hypothesis 5 anticipates a negative association between the duration of urban residence and employment after pension age. Model 1 provides support to this hypothesis and shows that the odds ratio of employment was 80.1% and 89% lower among migrants who stayed in urban destinations for 10 to 29 years and at least 30 years, respectively. In Model 3, the effects of urban residence duration on employment become weaker after introducing welfare contexts. It suggests that older migrants staying in urban destinations longer are less likely to work after pension age.

We expect that return migrants are more likely to engage in employment after pension age than continuing migrants in hypothesis 6. The result from Model 2 confirms this hypothesis, showing that older return migrants were 1.6 times more likely than continuing migrants to work after pension age. Consistent with hypothesis 7, Model 2 shows negative associations of employment after pension age with an urban citizenship status. Urban hukou holders had 92% lower odds of employment than temporary rural-to-urban migrants, followed by permanent rural-to-urban migrants who had 79% lower odds of employment after pension age. By contrast, the odds of employment after pension age among rural hukou holders were 2.292 times higher than that of temporary rural-to-urban migrants.

4.4.4 Robustness Analysis

We checked the robustness of our results. Firstly, we performed additional analysis to examine economic well-being (Tables S4.1 and S4.2) among older Chinese adults and revealed that urban-origin migrants were more likely to accumulate more financial resources, namely household per capita income and wealth, and be entitled to a higher monthly pension income than urban stayers, whereas rural-origin migrants and especially rural stayers had worse economic well-being. The results suggest that internal migration significantly differentiates the accumulation of economic resources and pension wealth, thereby influencing employment decisions after pension age. Second, we compared later-life employment before and after pension ages (Figure S4.1) and in different age groups (Table S4.3). We observed that the effects of internal migration on later-life employment were more prominent after reaching pension ages or at older ages (namely age 60, the maximum pension eligibility age). Third, we examined the effect of household registration type on employment after pension age and whether such effect varied by place of residence and return migration (Table S4.4 in Supplementary material). We found that migrants living in urban areas and holding a non-agricultural hukou had the lowest odds of employment after pension age than their counterparts. The negative effect of non-agricultural hukou on employment after pension age could be enhanced by urban residence, but not by return migration. The results suggest that migrants who hold an urban citizenship status and stay in urban areas may have more advantaged welfare protection for retirement than other migrant groups. Moreover, to resolve concerns about potential migration selectivity, we employed the Heckman selection probit model. The results reaffirmed the associations between internal migration features and employment after pension age (Table S4.5), implying that migration selectivity may not bias our findings. Lastly, we found that using working hours to capture employment status after pension age (Tables S4.6 and S4.7) yielded similar results.

4.5 Discussion and Conclusions

Migration and workforce ageing are interrelated dynamics in demographic and economic development. However, retirement and migration researchers have generally neglected to communicate with each other, making our current understanding of these two life transitions unexpectedly disconnected. The current study sheds new light on the interdependence between migration and employment in later adulthood by investigating how internal migration affects work after pension age in ageing China. Our findings reveal considerable differentiation in employment behaviours among older Chinese adults, shaped by lifetime mobility and distinct migration characteristics.

First, lifetime mobility, a common life course experience in older Chinese populations, negatively correlates with employment after pension age, supporting hypothesis 1. In the entire pensioner sample, lifetime migrants had lower odds of employment after pension age. The findings suggest that Chinese internal migrants may have improved economic resources and fewer financial needs for working at older ages. We further demonstrate that the economic returns of migrations exist in both urban and rural regions: lifetime migrants from rural areas may be less likely to work after pension age than lifetime rural stayers; in urban areas, lifetime migrants also have a lower likelihood of employment after pension age than lifetime non-migrants. Because migration usually can improve employment opportunities in the labour market (Greenwood, 2021), migrants wherever they are from can accumulate more wealth and prepare for their retirement better than their non-migrant counterparts.

However, the economic opportunity of internal migration differs across regions. Our second hypothesis, which anticipates a regional gap between urban-origin and rural-origin migrants, receives empirical support. Compared to urban non-migrants, urban-born migrants had a lower probability of employment after pension age but rural-origin migrants and lifetime rural stayers were more likely to work beyond pension age. The group differences could be explained by economic opportunities. Our additional results indicated that urban-origin migrants had better economic well-being, such as higher family income and more wealth, than urban stayers and that rural-origin migrants and rural stayers

faced greater financial restrictions. In the destination, urban-born migrants are often positively selected and can make greater socio-economic achievements by taking advantage of their high stock of family resources and human capital (Bernard, 2023; X. Wu & Treiman, 2007). Recent research observes that, compared to urban-origin migrants, rural-origin migrants may enjoy less economic returns of migration due to negative migration selection and employment instability in the destination, which further increase their financial needs for employment after pension age (Q. Zhang & Wu, 2023). The highest employment rate in later life among rural stayers may reflect that the economic cost of lifetime immobility in rural areas can be exceptionally high in late adulthood. This study brings the migration perspective to research on the urban-rural gap in later-life employment (Giles et al., 2023) and suggests that the place of origin can powerfully affect internal migrants' long-term economic outcomes.

Within the older migrant population, the complexity of internal migration history may lead to growing differentiation of later-life employment behaviours. The economic mobility mechanism that assumes a lower likelihood of employment after pension age among migrants who have benefited most from internal migration receives empirical support from our results. First, employment after pension age was affected by the timing of migration. Our results showed that migrants who moved in post-reform periods, particularly in the early reform era, were less likely to work after pension ages, indicating a more nuanced timing effect as expected in hypothesis 3. In China, people who migrated in the 1980s are more likely than pre-reform migrants to seize the newly released employment opportunities in the private economy because of China's market transition and the relaxation of migration restrictions (Fan, 1996). The findings have implications for studies on migration during economic recessions by suggesting that migrants who moved in periods lacking economic opportunities may confront disproportionate institutional and individual constraints in the labour force, casting lasting shadows on late careers.

Regarding migration distance, migrants who moved between provinces had lower odds of employment after pension age than intra-provincial migrants, supporting hypothesis 4. Previous research indicates that inter-provincial migrants can access jobs with more em-

ployment security such as contract and employment-based social insurance programmes (Su et al., 2018). With better work conditions, these long-distance migrants may be more likely to plan and save for retirement. However, recent years have witnessed a steady decline in inter-provincial migration in many developed countries (Molloy et al., 2011) and China. With rapid economic growth, shrinking regional developmental gaps may increase the attractiveness of cities in migrants' original provinces. Researchers argue that staying in familiar places may allow migrants to access resources in informal social networks and avoid possibly excessive costs of moving away (Schewel, 2020). But, in later life, our results suggest that older Chinese migrants staying at accessible locations have more financial necessity for prolonging their working lives after reaching pension age.

Moreover, hypothesis 5 expects that long-distance migration may reduce the financial need for longer working lives. Our results showed that the duration of urban residence was negatively associated with the odds of employment after pension age. As suggested by the escalator region hypothesis (Fielding, 1992) and the assimilation hypothesis (Chiswick et al., 2005), migrants who stay in urban destinations longer may be more likely to be economically assimilated and achieve greater career attainments. The argument is corroborated by the evidence that migrants staying in urban areas for 10 or more years had a lower propensity for employment after pension age. Given the high cost of living in urban areas, these migrants may enjoy a higher living standard, accumulate sufficient retirement wealth and, consequently, have fewer financial motivations for delaying retirement than other migrants, who either never moved to other urban areas or stayed in urban destinations for a short period. For example, long-stay older migrants are more likely to acquire housing property rights in urban China, which increases retirement security and reduces the need for continued employment (Xiao & Chen, 2022).

Despite potential economic returns, this research highlights that welfare contexts may affect migrants' decisions on employment after pension age. Our results showed that return migrants were more likely to engage in later-life employment than continuing migrants, in line with hypothesis 6 and previous evidence from Thailand and Vietnam (Junge et al., 2015). Unlike return migrants in countries with a universal welfare system

like Sweden (Lundholm, 2012), migrants who return to their hometowns in China must cope with losses in welfare rights. Given the difficulty in transferring pension insurance from place to place (L. Zhang & Li, 2018), Chinese migrants returning to their original prefectures may have more financial worries than continuing migrants. The literature has also shown that return migrants, especially local returnees, are older and less educated than non-return migrants (Junge et al., 2015). These disadvantaged return migrants may be forced to extend their working lives in settings without adequate old-age formal support. Our findings call for improved welfare portability (Taha et al., 2015) and suggest that older return migrants' welfare paucity must be addressed through strengthened employee pension coverage and welfare right portability.

Furthermore, our last hypothesis posits that legal status can affect employment after pension age among migrants. This hypothesis was confirmed by the evidence of higher odds of employment after pension age among migrants without an urban hukou, including temporary rural-to-urban migrants and migrants residing in rural areas. In China's urban context, urban hukou is a key form of citizenship that can determine access to local pensions and other exclusive welfare rights. As a result, migrants who were born in or permanently moved to urban areas through hukou conversion were less willing to work longer because urban citizenship can entitle them to local pensions and other welfare rights. Although China has implemented progressive reforms in its household registration system, the enduring adverse impact of hukou status may exaggerate retirement inequalities between different hukou holders after pensionable ages. The results resonate with previous research showing that rural-origin residents, including rural-to-rural migrants, and temporary rural-to-urban migrants, may be pushed to work longer by inadequate welfare support (Giles et al., 2023; Q. Zhang & Wu, 2023).

4.5.1 Implications and Limitations

This study shows that internal migrants make their retirement decisions in response to the extent of economic opportunity and welfare exclusion attributed to their migratory life course. Our findings convey important theoretical implications for understanding the

long-term consequences of internal migration, especially in numerous LMCs, where migrants from rural areas and peripheral towns will continue to make up a rising proportion of ageing workers. By bringing together research on internal migration and retirement, this study opens new avenues for future researchers to advance the conceptualisation and investigation of later-life transitions in temporal and spatial contexts. For migration research, our findings pinpoint that a better understanding of the economic and welfare integration of migrants could be achieved by examining their later careers. Migration researchers are encouraged to look beyond employment in young adulthood and focus on how older migrants navigate in the ageing workforce from a life course perspective. Meanwhile, research on later-life employment and retirement needs to recognise the substantive importance of lifetime migration. For example, hundreds of millions of internal migrants in China are ageing and may face increasingly diverse retirement opportunities. Significant volumes of migrant flows are also reported in many other developing countries. Hence, retirement researchers should probe deeper into the opportunities and challenges that older migrants may encounter in retirement decision-making and guide policymakers to adapt proactively to workforce ageing.

It is important to note that socio-economic inequalities in late working careers among older migrant populations may deserve special policy attention. Our findings show that pre-migration circumstances and post-migration integration contribute to differentiation in retirement behaviours between migrants and non-migrants and within migrants. In the context of delaying retirement, researchers have warned that intensified policy efforts that promote longer working lives may consolidate the vulnerability of disadvantaged older workers (Lain & Phillipson, 2019; Turek et al., 2024). Hence, the principal policy implication of this study is that removing migration restrictions through public policies that expand employment opportunities and promote equal and unified welfare protection could help build a sustainable ageing workforce. Specifically, this research suggests that governments should improve retirement security for returnees, temporary migrants, and rural non-migrants, who may work longer due to limited welfare protection, and, meanwhile, carefully reform retirement policies to retain intra-urban migrant workers with

abundant work-ability in the labour force.

Yet, the interpretation of our findings should bear several caveats in mind. First, this study relied on retrospective data on internal migration, which may be subject to recall bias because older people may encounter more cognitive difficulties in reporting detailed information on their past migration or unsuccessful move than younger adults. Nonetheless, the life history survey enables researchers to uncover complex life events, especially internal migration (Bernard, 2023; Z. Chen et al., 2022). Future research could profile the joint trajectories of migration, employment, and family using prospective survey data over extended periods to investigate how interrelating life experiences influence older migrants' later-career decisions. Second, this study did not explore the economic and welfare processes linking migration and retirement in more detail. We have identified economic opportunity and welfare exclusion mechanisms to explain why migration affects later-life employment. It is imperative to deepen the understanding of the economic and welfare integration process by examining older migrant workers' financial situations and welfare considerations before and after retirement transitions. Lastly, our focus on internal migration among older Chinese populations may limit the generalisability of our findings to other contexts. It is worth investigating how lifetime migratory experiences, either inter-regional or international, are associated with retirement behaviour in diverse institutional contexts and how the social security systems can proactively respond to the ageing of migrant workers.

4.5.2 Conclusions

Human migration and population ageing are two of the most profound demographic transitions in the contemporary world. This chapter advanced our knowledge of the interrelating dynamics of internal migration and extended working lives in China. It shows that migration may improve retirement preparation, especially for urban-origin migrants. Older migrants from rural areas often face more retirement-related constraints that necessitate a longer working life. The lack of economic mobility and exposure to welfare exclusion can increase the propensity to delay retirement among older migrants

in China. The findings suggest that public policies should consider the interplay between internal migration and retirement in future policy agendas. Disadvantaged older migrants who can not afford retirement, must be supported by policies and services that promote successful ageing at the workplace.

This chapter has shown that China's ageing workforce is over-represented by older workers from lower socio-economic status. However, the health effects of different late-career choices on individual lives remain to be investigated further. Can older workers benefit from workforce participation? If so, are there any differences by late-career stage (pension eligibility)? Who will gain more health-related benefits? In the next chapter, I will answer these questions by examining the relationships between late-career engagement and all-cause mortality.

Table 4.1. Descriptive summary of the sample at baseline, by lifetime mobility, in China, 2011
($N = 10,036$).

Variable	Total	Non-migrant	Migrant	p -value ^b
N (%)	10,036	7,042 (70.17%)	2,994 (29.83%)	
<i>Demographics</i>				
Age, mean (SD)	60.92 (7.11)	60.72 (7.02)	61.39 (7.28)	<0.001
Cohort				
Cohort ≤1945	26.63%	25.66%	28.92%	0.003
Cohort 1946–1949	16.50%	16.39%	16.77%	
Cohort 1950–1954	27.40%	27.61%	26.92%	
Cohort 1955–1959	23.91%	24.74%	21.98%	
Cohort 1960+	5.55%	5.61%	5.41%	
Sex (Male=1)	50.30%	49.79%	51.50%	0.12
Ethnic minority (Yes=1)	7.74%	8.14%	6.81%	0.023
Education level				
Illiterate	30.36%	33.30%	23.45%	<0.001
Primary school	42.45%	43.48%	40.01%	
Middle school	16.90%	15.31%	20.64%	
High school or above	10.29%	7.91%	15.90%	
Marriage (Married=1)	71.86%	74.01%	66.80%	<0.001
Number of children, mean (SD)	2.77 (1.42)	2.81 (1.43)	2.68 (1.40)	<0.001
Physical disability (Yes=1)	17.35%	18.13%	15.50%	0.001
Current hukou (Non-agricultural hukou=1) ^a	19.66%	13.12%	35.04%	<0.001
Current area type (Urban=1) ^a	35.39%	30.62%	46.63%	<0.001
<i>Childhood family backgrounds</i>				
Parental education (Literate=1)	35.78%	33.73%	40.61%	<0.001

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Parental employment (Non-agricultural job=1)	17.02%	13.60%	25.05%	<0.001
Family's financial situation, mean (SD)	2.45 (0.98)	2.41 (0.97)	2.54 (0.99)	<0.001
Place of origin (Urban=1) ^a	25.81%	30.49%	14.80%	<0.001
Region of birthplace				
Eastern China	31.83%	33.57%	27.72%	<0.001
Central China	28.53%	28.29%	29.09%	
Western China	32.69%	32.02%	34.27%	
Northeastern China	6.95%	6.12%	8.92%	

Notes: ^a Current hukou, current area type, and place of origin were used to determine the legal status. ^b Group differences were tested using Pearson's chi-squared tests for categorical variables and two-sample *t* tests for continuous variables, respectively.

Table 4.2. Descriptive features of internal migration history among migrants ($N = 2,994$).

Feature	Level	Percentage
Lifetime mobility	Rural-origin migrant	85.20%
	Urban-origin migrant	14.80%
Internal migration frequency	Once	46.23%
	Twice	32.83%
	Three or more	20.94%
Timing of initial migration	Pre-reform era (before 1978)	65.05%
	Early reform era (1978–1990)	18.28%
	Later period (1991–2011)	16.67%
Distance of initial migration	Intra-provincial migration	60.18%
	Inter-provincial migration	39.82%
Duration of urban residence	<10 years	65.26%
	10–29 Years	10.45%
	30+ years	24.28%
Return migration	Continuing migrant	31.73%
	Return migrant	68.27%
Legal status	Rural hukouer	49.83%
	Urban hukouer	17.84%
	Permanent rural-to-urban migrant	17.07%
	Temporary rural-to-urban migrant	15.26%

Table 4.3. The likelihood of employment after pension age due to lifetime mobility patterns in China, 2011–2020 (Odds ratios from multilevel logistic models).

	Model 1 Total	Model 2 Rural	Model 3 Urban	Model 4 Total
Internal migration				
Lifetime migrant (ref.: Stayer)	0.510*** (0.035)	0.387*** (0.028)	0.296*** (0.063)	
Lifetime mobility (ref.: Urban stayer)				
Rural-origin migrant				1.626*** (0.144)
Urban-origin migrant				0.252*** (0.044)
Rural stayer				4.186*** (0.342)
Demographics				
Age	0.920*** (0.006)	0.921*** (0.007)	0.914*** (0.010)	0.917*** (0.006)
Age-squared/100	0.675*** (0.029)	0.654*** (0.034)	0.919 (0.075)	0.701*** (0.030)
Cohort (ref.: Cohort 1950–1955)				
Cohort ≤1945	0.374*** (0.038)	0.488*** (0.053)	0.177*** (0.042)	0.402*** (0.040)
Cohort 1946–1949	0.710*** (0.065)	0.712*** (0.070)	0.607* (0.126)	0.689*** (0.062)
Cohort 1955–1959	1.721*** (0.164)	1.646*** (0.177)	1.591* (0.306)	1.622*** (0.152)
Cohort 1960+	1.874** (0.419)	1.631+ (0.454)	2.452* (0.941)	1.858** (0.409)
Male (ref.: Female)	3.768***	2.942***	5.140***	3.371***

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	(0.266)	(0.227)	(0.789)	(0.234)
Ethnic minority (ref.: Han)	0.703**	0.767*	0.442**	0.686**
	(0.086)	(0.100)	(0.130)	(0.083)
Education (ref.: Illiterate)				
Primary school	0.817**	1.002	0.590**	0.910
	(0.063)	(0.082)	(0.112)	(0.069)
Middle school	0.375***	0.542***	0.321***	0.479***
	(0.040)	(0.064)	(0.075)	(0.050)
High school or above	0.191***	0.309***	0.164***	0.268***
	(0.025)	(0.046)	(0.045)	(0.034)
Married (Yes=1)	1.226**	1.161 ⁺	1.025	1.142 ⁺
	(0.091)	(0.095)	(0.161)	(0.083)
Number of children	1.035	0.944*	1.193**	0.992
	(0.025)	(0.024)	(0.069)	(0.024)
Physical disability (Yes=1)	0.520***	0.488***	0.565***	0.506***
	(0.025)	(0.026)	(0.063)	(0.024)
Childhood family backgrounds				
Parental education (Literate=1)	1.117	1.120	1.304 ⁺	1.179*
	(0.075)	(0.083)	(0.186)	(0.078)
Parental employment (Non-agricultural job=1)	0.252***	0.563***	0.210***	0.392***
	(0.023)	(0.062)	(0.036)	(0.035)
Family's financial situation	0.861***	0.871***	0.883 ⁺	0.878***
	(0.028)	(0.030)	(0.063)	(0.028)

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Observations	32,827	23,953	8,874	32,827
Person	93,74	6,930	2,444	9,374
Log likelihood	-16972.059	-12476.853	-4247.348	-16776.392
AIC	33990.118	24999.706	8540.697	33602.785
BIC	34183.295	25185.635	8703.787	33812.760
ICC	0.626	0.575	0.691	0.609

Notes: AIC and BIC are Akaike's and Schwarz's Bayesian information criteria; ICC denotes intraclass correlation; Standard errors are in parentheses. All models include control for geographic regions.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.4. The Likelihood of employment after pension age due to features of internal migration history in China, 2011–2020 (Odds ratios from multilevel logistic models).

	Model 1	Model 2
Economic opportunity		
Timing of initial migration (ref.: Pre-reform era)		
Early reform era	0.734 ⁺ (0.133)	0.587 ^{**} (0.104)
Later period	0.731 ⁺ (0.127)	0.693 [*] (0.116)
Inter-provincial migration (ref.: intra-provincial migration)	0.695 ^{**} (0.085)	0.735 [*] (0.090)
Duration of urban residence (ref.: < 10 years)		
10-29 Years	0.185 ^{***} (0.040)	0.574 [*] (0.128)
30+ years	0.110 ^{***} (0.018)	0.456 ^{***} (0.086)
Welfare contexts		
Return migration (ref.: Continuing migrant)		1.611 ^{***} (0.216)
Legal status (ref.: Temporary rural-to-urban migrant)		
Rural hukouer		2.292 ^{***} (0.417)
Urban hukouer		0.080 ^{***} (0.020)
Permanent rural-to-urban migrant		0.210 ^{***}

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		(0.043)
Control variables		
Frequency of migration (ref.: Once)		
Twice		0.836
		(0.122)
Three or more		0.883
		(0.149)
Age	0.920***	0.914***
	(0.012)	(0.012)
Age-squared/100	0.724***	0.774**
	(0.066)	(0.070)
Cohort (ref.: Cohort 1950–1955)		
Cohort ≤ 1945	0.410***	0.549**
	(0.082)	(0.105)
Cohort 1946–1949	0.729 ⁺	0.885
	(0.125)	(0.144)
Cohort 1955–1959	2.934***	2.570***
	(0.554)	(0.475)
Cohort 1960+	4.885***	3.993***
	(2.030)	(1.644)
Male (ref.: Female)	3.469***	3.225***
	(0.483)	(0.453)
Ethnic minority (ref.: Han)	0.945	0.923
	(0.213)	(0.203)
Education (ref.: Illiterate)		
Primary school	0.734 ⁺	0.943
	(0.116)	(0.145)
Middle school	0.314***	0.603**
	(0.063)	(0.117)
High school or above	0.184***	0.606*

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	(0.042)	(0.141)
Married (Yes=1)	1.210	1.022
	(0.163)	(0.133)
Number of children	1.096 ⁺	0.968
	(0.052)	(0.045)
Physical disability (Yes=1)	0.545***	0.517***
	(0.052)	(0.049)
Parental education (Literate=1)	1.216	1.161
	(0.150)	(0.137)
Parental employment (Non-agricultural job=1)	0.291***	0.656**
	(0.045)	(0.107)
Family's financial situation	0.887*	0.930
	(0.052)	(0.053)
Observations	9,748	9,727
Person	2,723	2,718
Log likelihood	-4689.004	-4551.188
AIC	9432.008	9168.376
BIC	9625.998	9405.404
ICC	0.631	0.585

Notes: AIC and BIC are Akaike's and Schwarz's Bayesian information criteria; ICC denotes intraclass correlation; Standard errors are in parentheses. All models include control for geographic regions.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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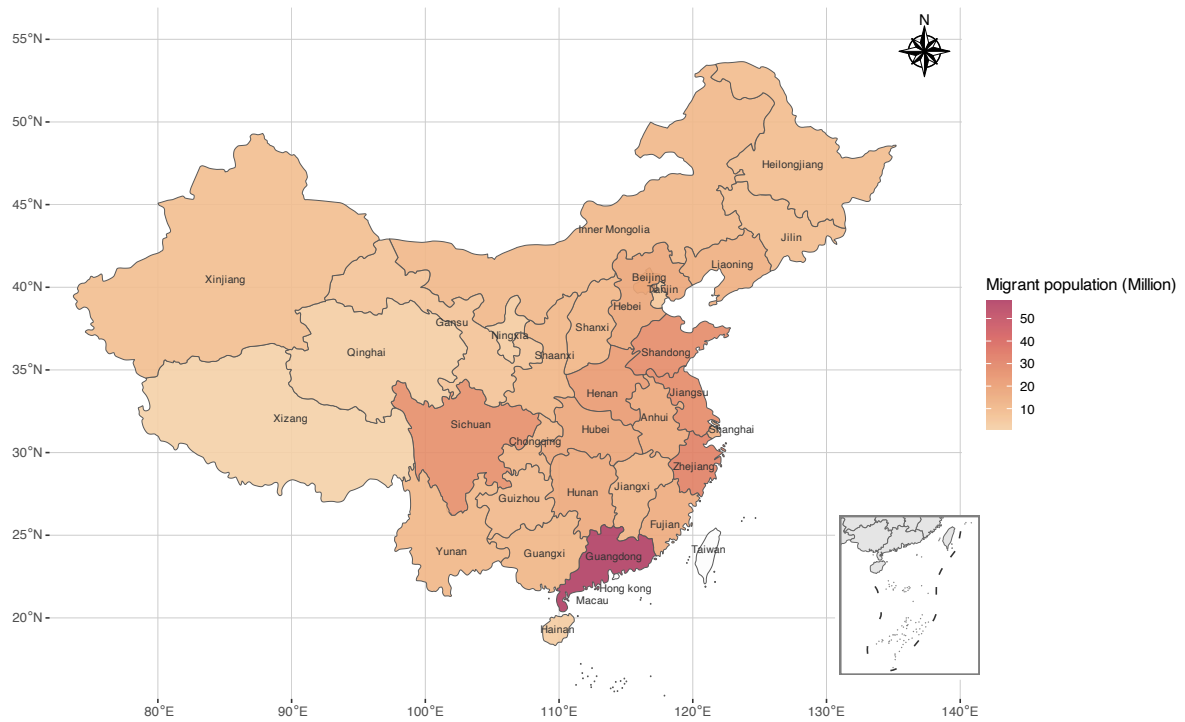


Figure. 4.1. Geographic distribution of China's internal migrant population, 2020. *Notes:* Estimation was based on the Seventh Census's long-form survey. Migrants were defined as individuals who left their places of household registration for at least 6 months.

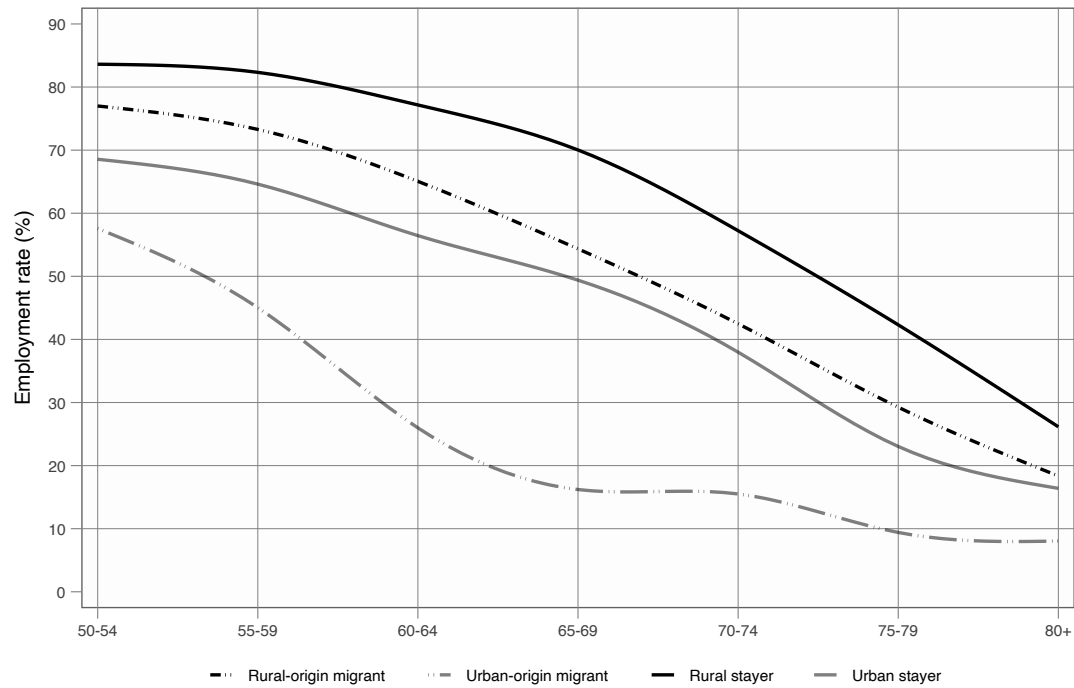


Fig. 4.2. Later-life employment rates by age group and lifetime mobility status (CHARLS 2011–2020).

Supplementary Material

Model Specification

Multilevel logistic regression was performed to examine the relationships between internal migration and employment after pension age among older Chinese adults. Defining Y_{it} as a binary variable indicating the employment status of person i at time-point t , $\Pr(Y_{it} = 1)$ denotes the expected probability of working beyond pension ages. The multilevel logistic regression model for lifetime mobility would be written as

$$\text{Logit}(\Pr(Y_{it} = 1)) = \alpha_{0i} + \alpha_1 \text{Lifetime_mobility}_i + \beta_1 Z_i + \beta_2 C_{it} + \mu_{0i} + e_{it}$$

where α_{0i} is shorthand for the intercept. Z_i denotes a vector of time-invariant control variables that may confound the link between migration and employment after pension age (such as family backgrounds) while C_{it} represents time-varying factors (such as age). e_{it} specifies observation-level residual and is expected to be normally distributed with covariates, while μ_{0i} denotes person-level residual. α_1 represents the effect size of lifetime mobility on employment after pension age, measured by exponentiated log odds, namely odds ratio (OR). When the OR for a specific category is larger than 1, it indicates increased odds of employment after pension age. On the contrary, an OR lower than 1 indicates a decreased likelihood of employment after pension age, or a higher propensity of actual retirement, relative to the reference group. When estimating the effects of internal migration history on employment after pension age, the variable lifetime mobility was replaced by two sets of independent variables representing various features of migration, namely economic opportunity and welfare contexts:

$$\text{Logit}(\Pr(Y_{it} = 1)) = \alpha_{0i} + \alpha_1 \text{Economic_mobility}_i + \alpha_2 \text{Welfare_context}_i + \beta_1 Z_i + \beta_2 C_{it} + \mu_{0i} + e_{it}$$

Time trends in employment were controlled by including linear age and quadratic age terms in the vector of covariates.

Table S4.1. The association of internal migration history and later-life economic well-being in China, 2011—2013 (Quantile regression models).

Quantiles		25th	50th	75th
Panel A: Household per capita income	Lifetime mobility (ref.: Urban stayer)			
	Rural-origin migrant	-535.001*** (96.205)	-900.634*** (156.979)	-452.938+ (253.955)
	Urban-origin migrant	2877.163*** (258.966)	3239.323*** (342.458)	4065.996*** (629.879)
	Rural stayer	-1180.594*** (81.807)	-2634.059*** (129.938)	-4190.530*** (202.348)
	Observations	32572	32572	32572
Panel B: Household per capita wealth	Lifetime mobility (ref.: Urban stayer)			
	Rural-origin migrant	-3333.451*** (426.756)	-5244.625*** (820.088)	-8867.873*** (1556.901)
	Urban-origin migrant	9835.337*** (1530.910)	18199.258*** (2877.071)	66622.459*** (6801.079)
	Rural stayer	-5442.578*** (364.232)	-13303.112*** (728.627)	-26779.306*** (1233.468)
	Observations	31947	31947	31947

Notes: Standard errors are in parentheses. The CHARLS data team imputed household per capita income and wealth in waves 1 and 2. Household per capita annual income and wealth were adjusted for inflation since 2010 using the consumer price index released by the National Bureau of Statistics of China (<https://data.stats.gov.cn/english/easyquery.htm?cn=C01>). The models controlled for demographics (age, age-squared/100, cohort, sex, ethnicity, education, marriage, number of children, and physical disability) and childhood family backgrounds (parental education, parental employment, family economic situation, and geographic region).

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S4.2. The association of internal migration history and monthly pension income in China, 2011—2020.

Models	MLM	Quantile	Quantile	Quantile
Quantiles		25th	50th	75th
Lifetime mobility (ref.: Urban stayer)				
Rural-origin migrant	-0.211*** (0.033)	-6.016*** (0.605)	-37.439*** (7.174)	-91.736* (41.606)
Urban-origin migrant	0.666*** (0.060)	1237.264*** (17.164)	1032.123*** (54.311)	431.471*** (43.096)
Rural stayer	-0.759*** (0.030)	-9.250*** (0.538)	-48.692*** (6.988)	-627.544*** (24.304)
Observations	26778	26903	26903	26903
Person	9139.000			
Log likelihood	-29992.792			
AIC	60037.583			
BIC	60250.662			
ICC	0.818			

Notes: MLM = multilevel linear regression model; Quantile = Quantile regression model; AIC and BIC are Akaike's and Schwarz's Bayesian information criteria; ICC denotes intraclass correlation; Standard errors are in parentheses. In the first linear model, we transformed monthly pension income into natural-logged values. Monthly pension income was adjusted for inflation since 2010 using the consumer price index released by the National Bureau of Statistics of China (<https://data.stats.gov.cn/english/easyquery.htm?cn=C01>). The models controlled for demographics (age, age-squared/100, cohort, sex, ethnicity, education, marriage, number of children, and physical disability) and childhood family backgrounds (parental education, parental employment, family economic situation, and geographic region).

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S4.3. The likelihood of employment after pension age due to lifetime mobility patterns in China, 2011—2020 (Odds ratios from multilevel logistic models).

	Model 1	Model 2	Model 3
	Aged <60	Aged 60-69	Aged 70+
Lifetime mobility (ref.: Urban stayer)			
Rural-origin migrant	1.490 (0.381)	1.627*** (0.179)	1.498** (0.219)
Urban-origin migrant	0.664 (0.218)	0.180*** (0.040)	0.225*** (0.076)
Rural stayer	7.957*** (2.232)	4.545*** (0.463)	3.425*** (0.466)
Observations	2389	18983	11455
Person	1232.000	7577.000	4318.000
Log likelihood	-1288.792	-9876.598	-6001.754
AIC	2623.584	19803.197	12049.509
BIC	2756.493	19999.479	12218.471
ICC	0.607	0.638	0.626

Notes: AIC and BIC are Akaike's and Schwarz's Bayesian information criteria; ICC denotes intraclass correlation; Standard errors are in parentheses. The models controlled for demographics (age, age-squared/100, cohort, sex, ethnicity, education, marriage, number of children, and physical disability) and childhood family backgrounds (parental education, parental employment, family economic situation, and geographic region).

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S4.4. The likelihood of employment after pension age due to household registration in China, 2011–2020 (Log odds from multilevel logistic models).

	Model 1	Model 2
Economic opportunity		
Timing of initial migration (ref.: Pre-reform era)		
Early reform era	-0.432* (0.174)	-0.431* (0.175)
Later period	-0.251 (0.168)	-0.259 (0.170)
Inter-provincial migration (ref.: intra-provincial migration)	-0.324** (0.124)	-0.317* (0.124)
Duration of urban residence (ref.: < 10 years)		
10–29 Years	-0.449* (0.213)	-0.367+ (0.212)
30+ years	-0.485* (0.190)	-0.439* (0.194)
Welfare contexts		
Return migration (ref.: Continuing migrant)	0.364** (0.135)	0.410* (0.166)
Non-Agricultural Hukou (Yes=1)	-0.997*** (0.279)	-1.933*** (0.256)
Urban (Yes=1)	-0.976*** (0.183)	-1.315*** (0.166)
Urban × Non-Agricultural Hukou	-1.356*** (0.329)	
Return migrant × Non-Agricultural Hukou		0.021

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		(0.260)
Control variables	Yes	Yes
Observations	9,748	9,748
Person	2,723	2,723
Log likelihood	-4536.497	-4544.900
AIC	9138.993	9155.801
BIC	9376.092	9392.900
ICC	0.576	0.579

Notes: AIC and BIC are Akaike's and Schwarz's Bayesian information criteria; ICC denotes intraclass correlation; Exponentiated coefficients; Standard errors are in parentheses. The models include internal migration frequency, demographics (age, age-squared/100, cohort, sex, ethnicity, education, marriage, number of children, and physical disability), and childhood family backgrounds (parental education, parental employment, family economic situation, and geographic region).

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S4.5. The effects of features of internal migration history on employment after pension age in China, 2011–2020 (Probit selection model).

	Selection model	Outcome model
	Lifetime mobility	Employment after Pension Age
Economic opportunity		
Timing of initial migration (ref.: Pre-reform era)		
Early reform era		-0.197** (0.067)
Later period		-0.106+ (0.063)
Inter-provincial migration (ref.: intra-provincial migration)		-0.112* (0.047)
Duration of urban residence (ref.: < 10 years)		
10–29 Years		-0.162+ (0.084)
30+ years		-0.279*** (0.071)
Welfare contexts		
Return migration (ref.: Continuing migrant)		0.185*** (0.050)
Legal status (ref.: Temporary rural-to-urban migrant)		
Rural hukouer		0.306*** (0.069)
Urban hukouer		-0.850*** (0.092)

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Permanent rural-to-urban migrant	-0.534*** (0.077)
Control variables	
Frequency of migration (ref.: Once)	
Twice	-0.086 (0.055)
Three or more	-0.044 (0.065)
Age	-0.037*** (0.005)
Age-squared/100	-0.138*** (0.035)
Cohort (ref.: Cohort 1950–1955)	
Cohort ≤1945	-0.133+ (0.072)
Cohort 1946–1949	-0.014 (0.061)
Cohort 1955–1959	0.349*** (0.071)
Cohort 1960+	0.558*** (0.158)
Male (ref.: Female)	0.441*** (0.053)
Ethnic minority (ref.: Han)	-0.088 (0.082)
Education (ref.: Illiterate)	
Primary school	-0.027 (0.058)
Middle school	-0.220** (0.074)
High school or above	-0.219*

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		(0.089)
Married (Yes=1)		0.016
		(0.049)
Parental education (Literate=1)	0.086**	0.081 ⁺
	(0.032)	(0.046)
Parental employment (Non-agricultural job=1)	0.455***	-0.117
	(0.039)	(0.076)
Family's financial situation	0.060***	-0.020
	(0.016)	(0.023)
Geographic region (ref. Eastern China)		
Central China	0.158***	0.156**
	(0.039)	(0.058)
Western China	0.221***	0.119*
	(0.037)	(0.058)
Northeastern China	0.317***	-0.085
	(0.062)	(0.094)
Constant	-0.937***	2.354***
	(0.048)	(0.398)
athrho	0.065	
	(0.126)	
Observations		32,548
N_selected		9,727
N_nonselected		22821.000
Log pseudolikelihood		-24572.941

Notes: Person-level clustered robust standard errors are in parentheses.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Compared to self-reported employment status, working time provides a more objective indicator of labor supply and is an alternative measure of retirement (Denton & Spencer, 2009). In CHARLS, the respondents were asked whether they participated in any agricultural and non-farm work during the past year. Working participants reported the number of months, days per week, and hours per day spent in the labor force. Based on weekly working hours, employment after pension age was coded as 1 if an individual worked at least 8 hours per week and 0 otherwise. We used working hours reported in the next wave (leading indicator of employment status) to get rid of potential reporting issues. Multilevel logistic regression was performed to examine the associations between internal migration history and working time.

Table S4.6. The likelihood of employment after pension age (based on working hours) due to lifetime mobility patterns in China, 2013—2020 (Odds ratios from multilevel logistic models).

	Model 1	Model 2	Model 3	Model 4
	Total	Place of origin		Total
		Rural	Urban	
Internal migration				
Lifetime migrant (Yes=1)	0.516*** (0.041)	0.396*** (0.033)	0.371*** (0.090)	
Rural-origin migrant				1.552*** (0.159)
Urban-origin migrant				0.323*** (0.065)
Rural stayer				3.954*** (0.373)
Observations	23193	16821	6372	23193
Person	8444.000	6218.000	2226.000	8444.000
Log likelihood	-12304.938	-9185.567	-2953.572	-12175.721

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AIC	24655.877	18417.134	5953.144	24401.442
BIC	24841.064	18594.933	6108.617	24602.732
ICC	0.645	0.601	0.709	0.631

Notes: AIC and BIC are Akaike's and Schwarz's Bayesian information criteria; ICC denotes intraclass correlation; Standard errors are in parentheses. The models controlled for demographics (age, age-squared/100, cohort, sex, ethnicity, education, marriage, number of children, and physical disability) and childhood family backgrounds (parental education, parental employment, family economic situation, and geographic region).

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S4.7. The likelihood of employment after pension age (based on working hours) due to features of internal migration history in China, 2011—2020 (Odds ratios from multilevel logistic models).

	Model 1	Model 2
Economic opportunity		
Timing of initial migration (ref.: Pre-reform era)		
Early reform era	0.580* (0.132)	0.450*** (0.102)
Late migration	0.819 (0.164)	0.735 (0.142)
Inter-provincial migration (ref.: intra-provincial migration)	0.736* (0.108)	0.780+ (0.115)
Duration of urban residence (ref.: < 10 years)		
10-29 Years	0.211*** (0.055)	0.676 (0.183)
30+ years	0.121*** (0.024)	0.471*** (0.106)
Welfare contexts		
Return migration (ref.: Continuing migrant)		1.506* (0.242)
Legal status (ref.: Temporary rural-to-urban migrant)		
Rural hukouer		2.264*** (0.493)
Urban hukouer		0.068*** (0.021)

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Permanent rural-to-urban migrant		0.198***
		(0.049)
Observations	6963	6947
Person	2457.000	2452.000
Log likelihood	-3250.365	-3148.616
AIC	6554.731	6363.231
BIC	6739.637	6589.151
ICC	0.670	0.628

Notes: AIC and BIC are Akaike's and Schwarz's Bayesian information criteria; ICC denotes intraclass correlation; Standard errors are in parentheses. The models controlled for migration frequency, demographics (age, age-squared/100, cohort, sex, ethnicity, education, marriage, number of children, and physical disability), and childhood family backgrounds (parental education, parental employment, family economic situation, and geographic region).

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

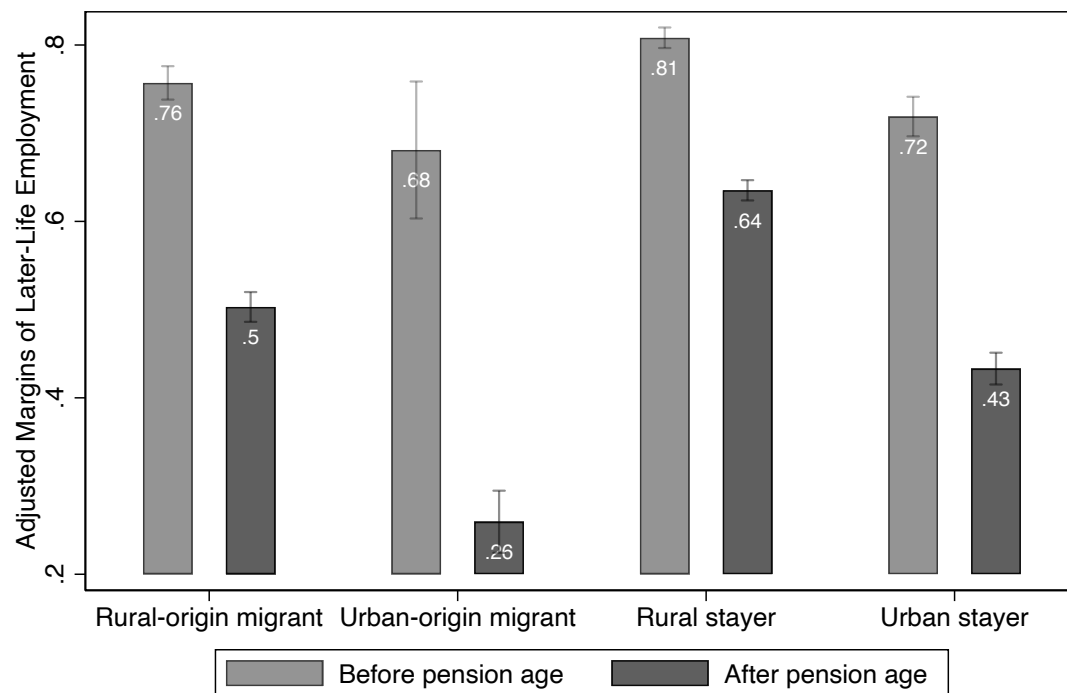


Figure S4.1. Predicted probability of later-life employment among non-pensioners and pensioners.

Chapter 5

Work Longer, Live Longer?

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Work Longer, Live Longer? Late-Career Engagement and Longevity in China

Abstract: The literature suggests that later-life employment may benefit health and survival. It remains unclear whether the longevity premium of late-career engagement differs by pension eligibility. Utilising five waves of nationwide survey data from the China Health and Retirement Longitudinal Study collected during 2011–2020, this study employed Weibull survival models to examine all-cause mortality risks in four groups of older populations: (1) inactive non-pensioners; (2) regular workers; (3) working pensioners (bridge employees); and (4) full retirees. In the sample of 12,031 older adults (aged 50–79 at baseline), 14.87% were deceased in follow-up waves. Results showed that the hazard of all-cause mortality was higher in inactive non-pensioners (Hazard ratio [HR] = 1.67, 95% confidence interval [CI]: 1.39–2.02) but lower in working pensioners (HR = 0.52, CI: 0.43–0.62), relative to regular workers. Nonetheless, differences in mortality risks between regular workers and full retirees were minimal. Further analyses indicated that male, younger, and better-educated working pensioners had lower hazards of all-cause mortality than regular workers whereas full retirement was only associated with lower mortality risk among urban residents. Moreover, the negative association between employment continuity and all-cause mortality was more salient among working pensioners who participated in the resident pension scheme and received a below-median pension income. Overall, the findings support the longevity premium hypothesis that employment continuity, especially among older pensioners with more socio-economic resources but inadequate retirement protections, can enhance longevity over the long term while workforce detachment before pension entitlement increases the risk of all-cause mortality.

Keywords: Bridge employment; Late-career engagement; Longevity; Pension eligibility; Social stratification; China

5.1 Introduction

With lengthening life expectancy, older people are conferred with extended years in retirement. In OECD countries, for example, average life expectancy at retirement increased to 22.8 years for men and 18.4 years for women in 2022, respectively (OECD, 2023). The retirement life spans are exceptionally lengthier in urban China, where female employees retire in their early or mid-fifties. Prevalent early exit and massive retirement have resulted in an enormous burden on the healthcare and pension systems (for example, Y. Zhang et al., 2018) and the waste of valuable human resources. For ageing societies, widespread public concerns about workforce shrinking and increasing healthcare demands are unlikely to be addressed unless older populations with abundant work capabilities can be transformed into active economic and societal contributors through progressive policy interventions (Bloom et al., 2010). In response, many governments have introduced pension reforms to curtail early workforce exit and encourage longer working lives (Ebbinghaus & Hofäcker, 2013). Driven primarily by economic deliberations, few policymakers have recognised the non-financial implications of extended working lives for older populations. One of the uncertain debates over current reforms is whether delayed retirement can benefit health and survival. Although a growing number of older people seek economic opportunities after retirement, only a few view employment as an active investment in health and psychological well-being (Q. Zhang & Wu, 2023). With low awareness of the health effects of late-career engagement, older people may be reluctant to stay in or re-enter the labour force after retirement.

The late-career stage refers to employment-related behaviours among mature adults aged 50 years or above (Greller & Simpson, 1999). As workers age, they must evaluate their retirement opportunities and decide their workplace withdrawal timing and pathway (Feldman & Beehr, 2011). Despite the attractiveness of leisure life, prolonged employment is a key form of productive engagement in society (Morrow-Howell & Greenfield, 2016) and can smooth the transition to retirement. The rising complexity of retirement presents a unique challenge to researchers that employment and retirement are not mutually exclusive life statuses (Hershenson, 2016; Kojola & Moen, 2016). Consequently, the

associations between employment, retirement, and mortality cannot be fully distinguished without accounting for the changing dynamics of work and non-work in later adulthood. A wealth of empirical studies has shown that employment was associated with increased well-being and a lower risk of mortality compared to non-employment (Luoh & Herzog, 2002; Marmot & Shipley, 1996; Morris et al., 1994; Nie et al., 2020; Scotti, 2022; D. Sullivan & von Wachter, 2009), but the mortality risk of economic inactivity may differ by the retirement transition process. Most studies (for example, Guo & Qian, 2023) broadly discuss the mortality risks of economic inactivity in later life, leaving nuanced differences between pre-retirement workforce withdrawal and full retirement virtually indistinguishable. Scholarly attempts to identify the effect of retirement on mortality have produced mixed findings (Murayama et al., 2022; Shim et al., 2013) because retirement is no longer equivalent to non-employment. It is also argued that bridge employment, defined as employment continuity after pension ages, is a protective factor for later-life health and may increase longevity (Yin et al., 2022). However, few studies have comprehensively examined whether labour market activities before and after pension eligibility ages may similarly or differently affect older adults' lives.

Given the evolving retirement landscape, the conceptualisation of late-career engagement requires the joint use of multiple characteristics (Denton & Spencer, 2009). For example, recent researchers have identified a growing group of working pensioners compared to full retirees based on employment status and pension eligibility (Dingemans & Henkens, 2019; Dingemans et al., 2017; Hokema & Scherger, 2016). By similarly considering both pensioners and non-pensioners, this study tentatively developed an ideal type of late-career engagement that categorises older people into four groups: inactive non-pensioners (not working before reaching pension eligibility ages), regular workers (working before retirement), working pensioners (working while receiving a pension income), and full retirees (not working in retirement). This conceptual approach enabled us to better unpack the complex nature of employment and retirement than previous research.

This study aims to examine the associations between late-career engagement, par-

ticularly employment continuity among working pensioners, and all-cause mortality in a nationally representative sample from China. As the world's largest developing economy, China's development is facing huge demographic challenges associated with falling fertility and population ageing. In many Western countries, a unified pension eligibility age, despite the ongoing adjustments, usually provides a powerful reference point to most older workers ¹ (OECD, 2023). In contrast, China's multi-layered pension system (Zhu & Walker, 2018) creates notable variations in pension eligibility ages and retirement protections among older workers of different sexes, occupational classes, and pension schemes. Therefore, research focusing on employment, retirement, and mortality in China must pay more attention to the inherent heterogeneity in older (worker) populations. This study will further examine how later-career engagement may interact with demographic and socio-economic backgrounds as well as pension policies in shaping all-cause mortality risks among older Chinese adults. My research questions were as follows: (1) Is employment associated with a lower risk of all-cause mortality? If so, do older workers have similar or different mortality risks before and after being entitled to pension income? (2) Are there any demographic and socio-economic disparities in the associations between late-career engagement and mortality? (3) Which kinds of older pensioners benefit more from working beyond pensionable ages?

5.2 Theoretical Background

5.2.1 Employment, Retirement and Health

Engagement in paid employment represents an active pursuit of productive ageing in later adulthood (Morrow-Howell & Greenfield, 2016). According to continuity theory (Atchley, 1989), employment is essential for older adults to maintain their identity and social roles. The underlying assumption is that ensuring continuity during the transition from employment into retirement can benefit later-life health and well-being while life disruptions may induce retirement maladjustment. Traditionally, mandatory retirement

¹Only six OECD countries have gender-specific normal pension ages in 2022.

policies force older workers to quit their jobs permanently at certain ages. The abrupt and complete withdrawal from the workforce constitutes a major life event in mid-later years that may produce considerable changes in social roles and lifestyles. In recent decades, retirement has increasingly evolved into a complex transition process that enables older people to develop distinctive experiences of retirement transitions and pursue various post-retirement goals (Hershenson, 2016). As the traditional retirement arrangements have been largely de-institutionalised, growing proportions of older people re-enter the workforce after being entitled to pension benefits (Cahill et al., 2017). Employment continuity may bring various benefits of productive activities into older ages, such as health and longevity (Luoh & Herzog, 2002; Murayama et al., 2022).

The literature over decades has shown complex relationships between employment, retirement and mortality (Sewdas et al., 2020; Shim et al., 2013). In early research, many researchers found lower standardised mortality ratios (SMRs) among older workers than retired adults (McMichael, 1976). It is argued that the higher mortality risk of older retirees may be attributed to a well-known selection bias, namely “the healthy worker effect” (C.-Y. Li & Sung, 1999): Healthy adults may stay in the workforce while older workers with poor health may be more likely to withdraw from the labour force or retire early. For older people, health-related factors may constitute a key driver of non-employment and retirement decisions (Blundell et al., 2023). As a result, the selection may contribute to a higher mortality risk among retirees than older workers (Sewdas et al., 2020). Nonetheless, much evidence shows that the longevity premium of employment may operate beyond health selection. After considering various health conditions, subsequent research revealed that non-employment was associated with a higher mortality risk (Fitzpatrick & Moore, 2018; Marmot & Shipley, 1996; Morris et al., 1994; Roelfs et al., 2011).

In addition, the social causation hypothesis emphasises employment as an investment in health. Continuous employment is one of the fundamental strategies for workers to build up socio-economic resources that prevent mortality risks (Phelan et al., 2004). Preserved economic standing can enable older workers to pursue a healthy lifestyle (Cock-

erham, 2005). However, economic inactivity, induced by voluntary or involuntary labour force withdrawal, may beget chronic stress and negatively affect individual lifestyles. Evidence shows that early exit from the labour force was associated with an increased risk of mortality (Scotti, 2022; D. Sullivan & von Wachter, 2009). Moreover, the negative impact of non-employment on mortality tends to be causal and non-specific (Morris et al., 1994). Hence, I anticipate that employment may be associated with a lower mortality risk.

Hypothesis 1: *Employment reduces all-cause mortality risk.*

Research findings on the mortality risk of retirement remain highly inconclusive. Although much evidence has shown that retirement may positively affect mental health and subjective well-being (Garrouste & Perdrix, 2022), it is unclear how retirement may impact objective health, particularly mortality. A small number of studies argue that retirement may lead to more health issues, such as cognitive decline (Clouston & Denier, 2017) and a higher mortality risk (Nie et al., 2020). Another strand of research shows that retirement reduces the mortality risk of older retirees (Brockmann et al., 2009). Other studies failed to detect meaningful relationships between retirement and mortality risk (Garrouste & Perdrix, 2022; Hernaes et al., 2013; Rogne & Syse, 2018; Sewdas et al., 2020). In addition to health selection, one of the principal reasons for mixed findings on the health effects of retirement is that retirement patterns are undergoing unprecedented changes in contemporary society. Delaying retirement and post-retirement employment have gained growing popularity in older populations worldwide, producing increasingly individualised retirement transitions that may affect later-life health differently.

Research on post-retirement employment has shown that continued employment or delayed retirement usually benefits health compared to a complete retirement. Qualitative evidence illuminates that older people express a growing interest in working after pensionable ages and maintaining economic independence (Kojola & Moen, 2016). In addition to financial motives, social, personal and generative goals may play a formative role in later-life employment decisions (Dendinger et al., 2005). For example, returning to work allows older people to continue contributing to their families and society (Ko-

jola & Moen, 2016; Morrow-Howell & Greenfield, 2016). Although many older workers are performing labour-demanding and less secure tasks in the workplace (Furunes et al., 2015; Lain & Phillipson, 2019), the positive impacts of employment continuity deserve further attention. For example, Cahill et al. (2024) report that bridge employment could improve economic security among older workers with financial restrictions. Evidence has suggested that employed older adults may have better cognitive functioning, better mental health, and more physical activity than inactive older adults (Luoh & Herzog, 2002), which may contribute to longevity. In addition, delayed transition into retirement can reduce mortality risks, regardless of health status (C. Wu et al., 2016). In this study, I contend that working after pensionable ages may promote health and reduce the risk of all-cause mortality (Guo & Qian, 2023; Yin et al., 2022).

Hypothesis 2: *Employment continuity after pension ages reduces all-cause mortality risk.*

5.2.2 Demographic and Socio-economic Disparities

The association between employment, retirement, and mortality may vary by socio-demographic groups. First, because health declines with age, the effect of workforce participation on mortality may differ by life stage. Younger and middle-aged workers tend to view employment as a social norm. For older people, continued employment may avoid the reduction in work-related physical activity (Slingerland et al., 2007), allow them to maintain their active social roles (Kojola & Moen, 2016), and prevent them from unhealthy behaviours. There is scattered evidence showing that workers of older ages benefited more from employment (Murayama et al., 2022; Staudinger et al., 2016). Therefore, the health preservation effect of continued employment may be more salient among older workers than younger workers.

Hypothesis 3: *The negative association between employment continuity and all-cause mortality is stronger among participants of older ages.*

The inquiry into how later-career engagement affects mortality should consider the gender dimension (Scotti, 2022). In the Chinese context, men are typically breadwinners

in the household while women perform more family care duties. More importantly, the gendered retirement systems in China also discourage older women from participating in the labour force (K. Feng, 2023). Compared to older women, older men are more likely to engage in formal and regular employment, which may be conducive to health. Hence, the gender division of labour implies that continued employment may be more likely to protect against mortality in older men than older women.

Hypothesis 4: *The negative association between employment continuity and all-cause mortality is stronger among men than women.*

Moreover, social stratification may affect the association between late-career engagement and mortality risks. I first considered the urban-rural gap in the association between late-career engagement and all-cause mortality. Labour market circumstances differ significantly between urban and rural areas in developing countries. In rural China, a considerable share of older adults engage in self-employed farm work (de Brauw & Rozelle, 2004), which is often physically demanding. As a result, rural Chinese adults tend to have a higher rate of disability and worse mental health than urban residents. In urban China, older residents typically maintain excess capacity for work (Hou et al., 2021) and have access to skilled jobs. Over the long term, urban residents may gain more health-related benefits from working after pensionable ages than rural residents.

Hypothesis 5: *The negative association between employment continuity and all-cause mortality may be stronger among urban adults than rural adults.*

Education may also play a role in the link between late-career engagement and mortality. On the one hand, education is frequently found to be inversely related to later-life mortality (Huisman et al., 2013). This is mainly because education offers older adults a higher awareness of healthy lifestyles, more social support, and better access to health-care services (Luo et al., 2015). On the other hand, older adults of different educational backgrounds may face distinct retirement opportunities. In China, older people's labour force participation is highly constrained by education. Without enough retirement protections, less-educated older adults cannot afford a complete retirement in old age and often seek further employment opportunities (Giles et al., 2023). Hence, I propose that

education may increase older adults' ability to reap the longevity premium from continued employment.

Hypothesis 6: *The negative association between employment continuity and all-cause mortality may be stronger among better-educated adults than lower-educated adults.*

It is important to note that returning to the workforce among older pensioners may be driven by different reasons. In particular, older people in China may prolong their working lives because of the lack of retirement protections (Giles et al., 2023). As suggested by continuity theory (Atchley, 1989), the continuity of self-identity and social roles may be especially relevant for workers who rely highly on labour income and cannot afford a full retirement. Facing limited retirement security, these older workers, especially those who do not participate in employment-based pension schemes and receive lower pension benefits (Zhu & Walker, 2018), may prolong their working lives to preserve their health and financial well-being. Hence, continued employment may be a leveller that protects disadvantaged older pensioners against mortality risks. That is, working after pensionable ages can preserve the health of these low-status pensioners, compensating for their later-life vulnerability caused by limited retirement protections. I expect that older working pensioners facing retirement insecurities may have a lower risk of all-cause mortality than full retirees.

Hypothesis 7: *The negative association between employment continuity and the risk of all-cause mortality may be stronger among older pensioners with limited retirement protections (i.e., enrolled in resident pension schemes and receiving below-median pension benefits).*

5.3 Design and Methods

5.3.1 Data and Sample

The study used data from the China Longitudinal Health and Retirement Study (CHARLS), a nationally representative survey of community-dwelling residents aged 45 or above in China. Using a multi-stage and probability sampling procedure, the baseline survey was

conducted between June 2011 and Spring 2012 with a total of 17,708 participants selected from 150 counties in 28 provinces and municipalities (Zhao et al., 2014). The data were collected by interviewers, who were mostly recruited from universities and trained by the survey team in Beijing, via face-to-face household interviews guided by the Computer-Assisted Personal Interview system and a quality control team. The baseline participants were re-captured in four follow-up surveys in 2013, 2015, 2018, and 2020.

To compare the mortality risks between workers and non-workers, this study included participants aged between 50 and 79 in the baseline survey. Oldest-old participants aged 80 or above were excluded because they were less likely to maintain active workforce participation but might have worse health than younger age groups. In the 12,927 older adults, I removed participants who had no work experience or had missing data on baseline employment status ($n = 561$), did not participate in any follow-up surveys if not deceased ($n = 329$), and never reported pension status ($n = 6$). I performed analyses based on the remaining 12,031 respondents. Missing values in health and socio-economic resources among 28 respondents were imputed using multiple imputations by a chained equation.

5.3.2 Measures

All-Cause Mortality

In follow-up surveys during 2013 and 2020, information on the survival status of the baseline respondents was collected. Survival status was indicated either by the respondents if they were still alive in follow-up surveys or by proxy reports. Since 2013, the CHARLS identified the deceased respondents through a cover screen procedure, followed by exit and death cause interviews with a proxy informant, mostly from the deceased person's family.

Because the CHARLS only recorded the year and month of death for some of the deceased respondents, it was not feasible to obtain the exact timing of death. Following previous mortality research (K. Q. Xu et al., 2024), I measured the time of death as halfway between a deceased person's last interview and the wave when reporting the

death event. The survival time was measured by the number of months and right censored for respondents who were lost to follow-ups and remained alive at the fifth Wave, whose survival time was the duration between their first and last interviews.

Late-Career Engagement

Late-career engagement was measured by employment and pension eligibility, aligning with the literature (Denton & Spencer, 2009). First, I derived information on all types of employment activities, including non-agricultural employment, non-agricultural self-employment/family business helper, agricultural employment, and own agricultural activities. A respondent was considered as an older worker if he/she engaged in agricultural activities for at least 10 days or worked for at least one hour in non-agricultural jobs or remained currently on vacation, on leave, or in training, in line with studies elsewhere (X. Li et al., 2019). At the same time, the respondents were also asked whether they had started receiving pension income from either public or private schemes (pensioner or non-pensioner). For each type of pension, the year of starting receiving pension benefits was also collected. Based on this information, I imputed missing data on pension status and corrected inconsistent reports.

Then, four detailed groups emerged after tabulating employment and pension eligibility: (1) inactive non-pensioners, consisting of early exiters or unemployed adults who were not working and did not receive a pension income; (2) regular/pre-retired workers, referring to working adults who did not reach pension eligibility ages; (3) working pensioners, defined as working adults who had started to receive a pension income; and (4) full retirees, referring to pensioners who already exited from the labour force. Working pensioners were bridge employees who extended their working lives beyond the pensionable ages. The typology may outperform prior measures of economic activity status (Scherger et al., 2011) because the use of objective pension eligibility information avoids possible bias in self-reported retirement status and has good applicability in settings with a complex pension system.

Demographic, Socio-economic, and Health Information

Demographic characteristics included age, sex, marital status (married or unmarried), area of residence (urban or rural) and region (eastern, central, western, or northeastern China).

Socio-economic status was measured by education, occupation, and household income. Education was reported at baseline and grouped into four levels: 1 = illiterate, 2 = primary school or lower, 3 = middle school, 4 = high school or above. In stratified analyses, I also created a binary variable of education to indicate whether the respondents received an above-average level of education or not (1 = middle school or higher). The survey recorded the occupation of current jobs among workers and the last jobs for not working respondents. I categorised the respondents into two occupational groups: (1) high-level occupation, consisting of previous or current managers, professionals, or semi-professionals; and (2) lower- to middle-level occupation for intermediate or manual occupational groups (Carr et al., 2018). Household income was measured by per capita household annual income. The household income was transformed into decile points (1-10) stratified by the area of residence, with a larger value representing a higher rank of family income.

Physical health is a commonly reported confounding factor that affects both later-life employment and mortality (Murayama et al., 2022) and should be considered (Sewdas et al., 2020). Health was assessed by two indicators, namely self-rated health and chronic conditions. The respondents reported their general health status on a 5-point Likert scale from 1 (very poor) to 5 (very good). Regarding chronic conditions, a list of fourteen chronic diseases prevalent among older Chinese was used to screen whether the respondents had been diagnosed with any of the chronic conditions (e.g., Hypertension) by a doctor. The number of chronic illnesses was coded into a categorical variable, including none, one illness, two illnesses, three or more illnesses.

5.3.3 Modelling Strategy

The respondents' demographic, socio-economic, and health characteristics were profiled by late-career engagement status. Survival regression analyses with Weibull distribution

were carried out to examine the risk of all-cause mortality in different late-career groups. Although prior studies mostly employed the Cox proportional hazard models (for example, Guo & Qian, 2023; Yin et al., 2022), the test for proportionality using the Schoenfeld residuals showed that the relative hazards in time-to-event data were not constant across time. Additional model comparison indicated that the Weibull distribution model had the lowest absolute values of log pseudo-likelihood, Akaike's and Schwarz's information criteria than alternative survival models with log-logistic or exponential distributions.

I estimated the hazard ratios (HR) of later-career engagement in the univariate and adjusted survival models via two steps. First, I compared workers and non-workers to show the overall effect of employment on all-cause mortality in older adults. Then, I estimated the risks of all-cause mortality between the four late-career groups, including inactive non-pensioners, regular workers, working pensioners, and full retirees. By treating pre-retired regular workers as the reference group, I could (1) identify the risk of economic inactivity before pensionable ages, (2) compare the differences in employment before and after reaching pension eligibility ages, and (3) evaluate the effect of complete transition from employment to retirement. The interaction effects between key demographic and socio-economic factors and late-career engagement were tested to show the risk of all-cause mortality in different older populations. To further investigate how working pensioners might benefit from continued employment, I moved to the pensioner sample to estimate the effects of working beyond pension ages on mortality, stratified by pension type and benefit level. Individual sampling weights that adjusted for individual and household non-response were applied to all regression analyses. To check the robustness of our results, I also employed the entropy balancing approach, a quasi-experimental method that reduces covariate imbalance through a maximum entropy re-weighting procedure (Hainmueller, 2012). The comparison between late-career groups may be biased if the potential selection process retains healthier workers in the ageing workforce or pushes less healthy workers out of the labour market. Using a matched sample of workers (treatment group) and non-workers (control group) re-weighted by entropy balancing weights, I could re-estimate the hazard ratios of late-career engagement and evaluate the influence

of potential selection bias concerning workforce participation.

5.4 Results

5.4.1 Descriptive Results

At baseline, 57% of the respondents were working and 44% of the respondents already received pension income. Table 5.1 presents the weighted descriptive profiles of the study population. A further look at the table reveals that the working population had a larger proportion of males, married adults, and rural residents than non-workers. As for socio-economic resources, older workers were more educated, had a higher occupational status, and owned a better household income than inactive non-pensioners whereas the fully retired group had the most socio-economic resources. The two groups of older workers also had better health status and fewer chronic illnesses than inactive adults.

[Insert Table 5.1 here]

Overall, 15% of the older adults were deceased from 2011 to 2020. However, the highest prevalence rate of death was observed in inactive non-pensioners (25%), followed by fully retired people (19%). The two working groups had a lower prevalence rate of death as only 9% of working non-pensioners and 11% of working pensioners were deceased in later waves.

5.4.2 Is Late-Career Engagement Associated with Mortality Risk?

The results of survival regression analyses are presented in Table 5.2. According to the un-adjusted Model 1, workforce engagement was not associated with mortality. After adjusting for socio-economic, health, and demographic characteristics, I found that older workers had 40% (HR = 0.6, 95% confidence interval[CI]: 0.53-0.69) lower hazard of all-cause mortality, compared to non-workers (Model 2).

[Insert Table 5.2 here]

Moving beyond the binary employment status, the results showed that working pensioners appeared to have a lower hazard of all-cause mortality than regular workers in

un-adjusted Model 3. However, the hazard of mortality among inactive non-pensioners increased to 1.67 (CI: 1.39-2.02), suggesting that older adults who were not working and did not have a pension income were 1.67 times more likely to be deceased than regular workers. Meanwhile, although the hazards of all-cause mortality among two pensioner groups were lower than one, only the working pensioners had a meaningful and lower hazard of 0.52 (CI: 0.43-0.62), indicating that older workers who prolonged their working lives were 48% less likely to die in follow-up waves compared to not-yet-retired older workers.

5.4.3 Who Benefits from Late-Career Engagement?

The associations between late-career engagement and all-cause mortality can be found in different social and demographic groups (Table 5.3). Interaction analyses showed that the hazards of all-cause mortality among working pensioners and full retirees were lower relative to pre-retired workers, but such longevity premium decreased with ageing (Table S5.1). The confidence intervals of the interaction terms between sex and late-career engagement also indicated that the negative association of employment continuity with mortality was stronger among men than women. In urban areas, completely retired adults also had a lower hazard of mortality ($B = -0.39$, $p < 0.05$). With respect to education, the hazards of mortality among pensioners with middle school or higher education ($B = -0.49$, $p < 0.05$), particularly working pensioners, were also lower. The results of stratified analysis are presented in Table S5.1. I observed that the hazards of all-cause mortality in inactive pensioners were consistently higher in all demographic and social groups. Meanwhile, participants working after pension ages had relatively lower hazards of all-cause mortality.

[Insert Table 5.3 here]

Based on the pensioner sample, I further detected whether the type of pension scheme and benefit level might affect the associations between late-career engagement and all-cause mortality (Table S5.2). As shown in Figure 5.1, the hazard of all-cause mortality was generally lower in working pensioners compared to fully retired adults who did not

work. In particular, resident pension recipients were 37% less likely to experience death in follow-up periods ($HR = 0.63$, $CI: 0.41-0.98$) than retirees who completely withdrew from the workforce. In terms of pension income, the right panel shows that in pensioners with a below-median annual pension income, continued working was associated with a lower hazard of all-cause mortality ($HR = 0.58$, $CI: 0.46-0.73$) than full retirement. Working pensioners with a higher benefit level also had a lower hazard of all-cause mortality, but its upper confidence interval slightly extended beyond zero.

[Insert Figure 5.1 here]

To check the robustness of the results, I employed the entropy balancing approach to estimate the causal effect of employment on all-cause mortality. Using the entropy balancing approach, I matched workers and non-workers with similar characteristics and re-estimated the effect of late-career engagement on all-cause mortality in re-weighted data. The results in Table S5.3 remained consistent with Table 5.2. In the pensioner sample, working pensioners had lower hazards of all-cause mortality than full retirees. Table S5.4 shows that all types of older working pensioners could gain survival benefits from workforce participation, but the benefits appeared to be larger among more advantaged respondents with employment-based pension plans.

5.5 Discussion and Conclusion

The present study sought to investigate whether and how late-career engagement is associated with all-cause mortality risk in older populations. Using longitudinal data from China collected between 2011 and 2020, I systematically compared the risk of all-cause mortality between four groups, namely inactive non-pensioners, pre-retired employees, working pensioners, and full retirees. My primary attention was granted to working pensioners who extended their working lives after receiving pension income. The results suggest that working pensioners have the lowest risk of all-cause mortality than other groups while inactive non-pensioners have the highest mortality risk. Such longevity premium might be more salient in working pensioners with resident pension schemes and

insufficient pension income. The findings imply that working after the pension age may provide older workers with long-term survival benefits in China.

5.5.1 Longevity Premium of Late-Career Engagement

The results showed that a moderate proportion of older people participated in the workforce, with approximately 39% being regular workers and 18% being working pensioners. Although the two working groups had similar socio-demographic characteristics, working pensioners were older, had lower occupational status, and experienced more health issues than working pre-retirees. Meanwhile, working pensioners appeared to be more disadvantaged than full retirees in terms of education, occupational status, and household income. The results suggest that negatively selected working pensioners may be forced to work longer in China due to the lack of retirement protections (Giles et al., 2023). However, participants who were not working before pensionable ages, namely inactive non-pensioners, were more likely to be females, have lower socio-economic status, and report slightly worse health than working adults. Because Chinese families rely on older women to provide family care duties, their sacrifice of employment opportunities for family well-being may lead to economic exclusion in later adulthood.

The results of survival analyses showed that older workers had lower risks of all-cause mortality than older non-workers. This confirmed the social causation hypothesis that employment can benefit the health and survival of older people. More importantly, the findings shed new light on the longevity premium of late-career engagement by distinguishing pension eligibility. Before reaching pension ages, older adults out of the labour force had a higher mortality risk than their worker counterparts, in line with previous research (for instance, C. Wu et al., 2016). This result is unsurprising since early detachment from the labour force, either unemployment or early exit, can cause chronic stress and lead to premature onset of health problems. Social policies could be introduced to mitigate the mortality risk in inactive non-pensioners by providing more training and employment opportunities and promoting a productive lifestyle. Because long-term inactivity can impede the accumulation of retirement wealth and pension entitlement, the

government could implement active labour market policies to reduce unemployment risk for middle-aged adults. Moreover, community-based social services could identify the needs of inactive non-pensioners and provide psychosocial support for them to build resources for old age.

After reaching pension age, regular workers and full retirees may not differ substantially in mortality when health selection is considered (Scotti, 2022). Nonetheless, working pensioners had a lower mortality risk than regular workers and full retirees, corroborating the second hypothesis that working after pension age can reduce mortality risk. Prior research has revealed that working pensioners are more satisfied with their life and maintain better health than full retirees (Dingemans & Henkens, 2019; Silver et al., 2020). The findings add that late-career engagement may produce survival benefits for older adults, particularly pensioners (Yin et al., 2022). Although older people of lower socioeconomic status tend to extend their working lives, expanded longevity through later-life employment over the long term should deserve special policy attention. Public policies and intervention programmes encouraging longer working lives must provide more employment opportunities for disadvantaged older adults. For example, the government can offer training incentives for employers to rehire unemployed and retired older adults with a high willingness to work. In addition, multidimensional retirement planning programmes could be implemented in the workplace to support older workers, especially working pensioners, to enhance their retirement confidence and well-being (C. Liu, Bai, & Knapp, 2021).

5.5.2 Demographic and Socio-economic Disparities in Longevity Premium

The association between late-career engagement and all-cause mortality is contingent on demographic contexts. First, it shows that the longevity benefit of employment continuity may decrease with ageing. Contradictory to hypothesis 3 and previous research (Murayama et al., 2022), middle-aged adults may be more likely to capture longevity gains from continued employment than people of older ages. This is possible because

middle-aged workers often have more diverse employment choices and can realise their economic and social pursuits in the labour market. Due to age-based discrimination, older workers may have limited access to high-quality jobs and experience more work-related stress in China. Moreover, subtle gender differences in the effect of late-career engagement on all-cause mortality were found. I observed that older men stayed in the labour market as working pensioners had a lower mortality risk. Given that men are typically major breadwinners in Chinese families, older male workers shoulder the main responsibility for supporting the family financially. Through continued employment, working men can therefore maintain economic independence, fulfil their family goals, and develop their working careers. Unexpectedly, gender differences in the mortality risk of later-life employment were small in magnitude. The findings suggest that employment-based services should be delivered to older and female workers to reduce the inequalities in employment and health.

Socio-economic contexts also moderate the association between late-career engagement and all-cause mortality. The results demonstrated that better-educated working pensioners and urban full retirees were more likely to experience a lower mortality risk. In China, older adults from urban areas and better socio-economic backgrounds tend to choose full retirement (Giles et al., 2023) because they can accumulate more retirement wealth and have generous pension incomes. Nevertheless, employment continuity may be particularly beneficial for these participants, especially better-educated workers, in terms of survival, because of enhanced health preservation. With better employment conditions, these older workers with a higher stock of human capital may be more likely to re-access skill-intensive job offers, achieve personal development, and maintain social roles in the workplace (Furunes et al., 2015; Kojola & Moen, 2016). This is not to say that rural and less-educated older adults cannot benefit from employment. But for them, the longevity premium of employment was modest because their jobs may be more physically demanding and less secure due to labour market segmentation in China's context.

With respect to pension type and benefit level, the results indicate that working pensioners who had below-median pension benefits and enrolled in resident pension pro-

programmes may have the lowest mortality risks. It supports the hypothesis that employment continuity can work as a leveller that provides more survival benefits to disadvantaged working pensioners. These working pensioners have relatively fewer retirement protections than full retirees with more decent pension benefits (Zhu & Walker, 2018). Their continued engagement in the labour force can alleviate their retirement insecurity (Cahill et al., 2024) and preserve their health later in life. Because the entropy balancing re-weighted data showed inconsistent results, the greater survival benefits of disadvantaged working pensioners in observational data may largely stem from unobserved selection during retirement transitions. Working pensioners enrolled in the resident pension programmes may be more likely to stay in low-quality jobs with unfavourable employment conditions, which could potentially exert a negative influence on their health over the long term. Hence, the effects of late-career engagement on disadvantaged working pensioners should not be overstated. More research is needed to further understand how workforce participation affects the health and survival of older pensioners with different levels of retirement protection. At the policy level, policymakers should recognise the unequal retirement protections between different pensioner groups and design more targeted employment incentives for disadvantaged pensioners to broaden their economic opportunities in the ageing workforce. In addition, the willingness to re-enter the workforce among advantaged retirees and pensioners can be further increased by providing more flexible retirement options such as gradual retirement.

5.5.3 Limitations and Future Directions

Three limitations should be acknowledged here. First, I cannot assess the cause-specific mortality risk of late-career engagement due to limited data. There is evidence that employment may have more salient protective effects on the risks of cardiovascular disease mortality (Morris et al., 1994; Nie et al., 2020). Future research can detect the heterogeneous effects of late-career engagement on cause-specific mortality in older populations to advance our understanding of employment, retirement, and longevity. Second, I classified older adults into four groups but still overlooked the heterogeneity within each group.

The diversity of older populations can be better recognised by employing person-based approaches such as sequence analysis and clustering methods. For example, it is worth examining how different late-career engagement profiles (Scotti, 2022) are associated with all-cause mortality. Research can also categorise older workers based on work-related factors such as job strain (Dingemans & Henkens, 2020) and employment security to identify sub-populations that may face adverse working conditions. In addition, I did not account for the mediating mechanisms that may link late-career engagement and mortality. Various health and social pathways may potentially explain the associations between employment, retirement, and mortality. Future researchers can exploit prospective cohort surveys to detect to what extent employment at different late-career stages leads to the changes and continuity in health, lifestyle, and psycho-social resources that may contribute to longevity.

Despite these limitations, this study complements the current literature on employment, retirement, and mortality by showing how later-career engagement affects all-cause mortality risks. The major implication of the findings is that expanding employment opportunities for older people can benefit later-life survival. In the context of population ageing and the growing pension crisis, governments of developing economies must be better prepared for the rapidly ageing workforce. According to the findings, older adults' labour supply in later life in ageing China reflects substantial demographic and socio-economic differences. On the demand side, labour market reforms can offer more taxation-based incentives to employers to (re)hire unemployed adults and older workers, particularly older pensioners from lower socio-economic backgrounds. On the supply side, the willingness to re-enter the workforce and the employability of older people can be boosted through retirement preparation programmes and post-retirement employment services.

5.5.4 Concluding Remarks

Promoting longer working lives is essential to ensuring productive ageing in contemporary society. This research comprehensively examined the associations between late-career

engagement and all-cause mortality in China and demonstrated a consistent longevity premium of later-life employment. Specifically, inactive non-pensioners had a higher mortality risk than regular workers while working pensioners had a lower mortality risk. The findings also show that the longevity premium of employment continuity was more salient among younger, male, and better-educated respondents whereas full retirement only reduced mortality risk in urban areas. Moreover, within pensioners, it is evident that lower mortality risks were found in more disadvantaged working pensioners who had below-medium pension benefit levels and did not participate in employment-based pension programmes. Generally, the findings suggest that employment can benefit survival, particularly for working pensioners having more socio-economic resources while facing retirement insecurities.

From Chapters 2 to 5, I have examined the life-course temporal and spatial dynamics of late-career behaviours and the health impacts of late-career choices. To expand the breadth and depth of our knowledge of work and retirement in China, I will discuss the findings and their relevance to theory, policy, and practice in the following summary chapter.

Table 5.1. Descriptive characteristics of the sample at baseline.

	Total		Inactive non- pensioner		Regular worker		Working pensioner		Full retiree	
	N =		n = 2,043 (17.44%)		n = 5,060 (38.82%)		n = 2,302 (18.03%)		n = 2,626 (25.72%)	
	1,2031									
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Death (Deceased = 1)	0.15	0.36	0.25	0.44	0.09	0.29	0.11	0.31	0.19	0.39
Employment status (Working=1)	0.57	0.50								
Pension status (Pensioner=1)	0.44	0.50								
Demographic characteristics										
Age (years)	61.36	7.52	62.09	8.31	57.15	5.68	63.37	5.80	65.82	7.14
Sex (Male=1)	0.51	0.50	0.39	0.49	0.58	0.49	0.57	0.50	0.44	0.50
Marital status (Married=1)	0.86	0.35	0.78	0.42	0.91	0.28	0.89	0.31	0.81	0.39
Area type (Urban=1)	0.47	0.50	0.46	0.50	0.33	0.47	0.38	0.48	0.75	0.44
Geographic region										
Eastern China	0.36	0.48	0.33	0.47	0.36	0.48	0.38	0.48	0.35	0.48
Central China	0.27	0.44	0.26	0.44	0.26	0.44	0.29	0.45	0.25	0.43
Western China	0.30	0.46	0.33	0.47	0.31	0.46	0.28	0.45	0.28	0.45
Northeastern China	0.08	0.27	0.07	0.26	0.07	0.25	0.05	0.22	0.12	0.33
Socioeconomic status										

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Education											
Illiterate	0.29	0.45	0.39	0.49	0.29	0.46	0.27	0.44	0.22	0.41	
Primary school or lower	0.40	0.49	0.38	0.49	0.40	0.49	0.50	0.50	0.35	0.48	
Middle school	0.18	0.38	0.15	0.36	0.19	0.39	0.13	0.34	0.21	0.41	
High school or above	0.13	0.34	0.08	0.27	0.11	0.32	0.10	0.30	0.22	0.42	
Occupation											
(Manager/professional=1)	0.12	0.32	0.03	0.17	0.11	0.31	0.10	0.30	0.21	0.41	
Household income	5.65	2.88	4.73	2.91	5.60	2.92	5.78	2.81	6.25	2.68	
Physical health											
Chronic conditions											
No	0.30	0.46	0.30	0.46	0.36	0.48	0.31	0.46	0.21	0.41	
One	0.30	0.46	0.28	0.45	0.33	0.47	0.31	0.46	0.25	0.43	
Two	0.20	0.40	0.19	0.39	0.17	0.38	0.22	0.41	0.23	0.42	
Three or more	0.20	0.40	0.23	0.42	0.14	0.35	0.17	0.37	0.30	0.46	
Self-rated health	2.97	0.92	2.73	0.96	3.08	0.90	3.08	0.90	2.88	0.89	

Note. The data are weighted.

Table 5.2. Hazard ratios of all-cause mortality for late-career engagement groups in China, 2011–2020 (Weibull survival model).

	Model 1	Model 2	Model 3	Model 4
	Unadjusted	Adjusted	Unadjusted	Adjusted
Employment status (Working=1)	0.90 [0.79,1.03]	0.60*** [0.53,0.69]		
Late-career engagement				
Inactive non-pensioner			1.17 [0.98,1.41]	1.67*** [1.39,2.02]
Regular worker			Ref.	Ref.
Working pensioner			0.46*** [0.39,0.56]	0.52*** [0.43,0.62]
Full retiree			0.59*** [0.51,0.68]	0.90 [0.76,1.06]
Demographic characteristics				
Age		0.88*** [0.87,0.89]		0.89*** [0.88,0.90]
Sex (Male=1)		2.17*** [1.88,2.49]		2.18*** [1.90,2.51]
Marital status (Married=1)		0.66***		0.69***

	[0.54,0.80]	[0.57,0.84]
Area type (Urban=1)	0.93	1.02
	[0.80,1.07]	[0.88,1.19]
Eastern China	Ref.	Ref.
Central China	1.01	1.03
	[0.86,1.20]	[0.88,1.21]
Western China	1.06	1.07
	[0.90,1.25]	[0.91,1.25]
Northeastern China	1.16	1.17
	[0.91,1.47]	[0.93,1.48]
Socioeconomic status		
Education		
Illiterate	Ref.	Ref.
Primary school or lower	0.78***	0.83**
	[0.68,0.89]	[0.73,0.95]
Middle school	0.81	0.87
	[0.64,1.01]	[0.69,1.09]
High school or above	0.57***	0.64**
	[0.42,0.78]	[0.47,0.87]

Occupation		0.71*		0.72*
(Manager/professional=1)		[0.53,0.94]		[0.54,0.96]
Household income		1.00		1.02
		[0.97,1.02]		[0.99,1.04]
Physical health				
Chronic conditions				
No		Ref.		Ref.
One		1.10		1.14
		[0.92,1.31]		[0.95,1.36]
Two		1.12		1.21*
		[0.95,1.33]		[1.03,1.43]
Three or more		1.19*		1.28**
		[1.01,1.40]		[1.09,1.51]
Self-rated health		0.77***		0.78***
		[0.71,0.84]		[0.72,0.85]
Observations	1,2031	1,2031	1,2031	1,2031
Log pseudolikelihood	-1.14e+08	-1.01e+08	-1.11e+08	-9.92e+07

Notes: 95% confidence intervals in brackets.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.3. Estimated all-cause mortality risk for late-career engagement groups in China, 2011–2020, moderation analysis (Weibull survival model).

	Model 1	Model 2	Model 3	Model 4
	Sex	Age	Urban	Education
Late-career engagement				
Inactive non-pensioner	0.54*** [0.31,0.78]	0.57*** [0.32,0.83]	0.47*** [0.30,0.65]	0.49*** [0.32,0.65]
Regular worker	Ref.	Ref.	Ref.	Ref.
Working pensioner	-0.44** [-0.76,-0.11]	-0.88*** [-1.12,-0.65]	-0.63*** [-0.82,-0.45]	-0.61*** [-0.80,-0.41]
Full retiree	0.00 [-0.25,0.25]	-0.30* [-0.53,-0.06]	0.05 [-0.14,0.24]	-0.06 [-0.24,0.11]
Age (centred)	-0.12*** [-0.13,-0.10]	-0.13*** [-0.15,-0.11]	-0.11*** [-0.13,-0.10]	-0.11*** [-0.13,-0.10]
Sex (Male=1)	0.84*** [0.62,1.05]	0.71*** [0.58,0.84]	0.72*** [0.59,0.85]	0.71*** [0.59,0.84]
Area type (Urban=1)	-0.00 [-0.15,0.15]	-0.01 [-0.16,0.13]	0.13 [-0.11,0.37]	0.00 [-0.15,0.15]
Education (Middle school or higher=1)	-0.10 [-0.29,0.09]	-0.09 [-0.28,0.10]	-0.07 [-0.27,0.12]	0.06 [-0.19,0.31]
Interaction terms				

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Inactive non-pensioner \times Sex (Male=1)	-0.02 [-0.35,0.30]		
Working pensioner \times Sex (Male=1)	-0.33 [-0.72,0.05]		
Full retiree \times Sex (Male=1)	-0.21 [-0.51,0.09]		
Inactive non-pensioner \times Age (centered)		-0.00 [-0.03,0.03]	
Working pensioner \times Age (centred)		0.05** [0.01,0.08]	
Full retiree \times Age (centred)		0.03* [0.00,0.05]	
Inactive non-pensioner \times Area type (Urban=1)			0.05 [-0.33,0.43]
Working pensioner \times Area type (Urban=1)			-0.18 [-0.65,0.29]
Full retiree \times Area type (Urban=1)			-0.39* [-0.70,-0.08]
Inactive non-pensioner \times Education (Middle school or higher=1)			0.15 [-0.46,0.76]

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Working pensioner ×					-0.49*
Education (Middle school or higher=1)					[-0.94,-0.03]
Full retiree × Education (Middle school or higher=1)					-0.35 [-0.70,0.00]

Observations	1,2031	1,2031	1,2031	1,2031
Log pseudolikelihood	-9.93e+07	-9.90e+07	-9.91e+07	-9.92e+07

Notes: Raw coefficients are reported. 95% confidence intervals in brackets. All models include demographic (marital status and geographic region), socioeconomic (occupation and household income), and health (self-rated health and chronic conditions) controls.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

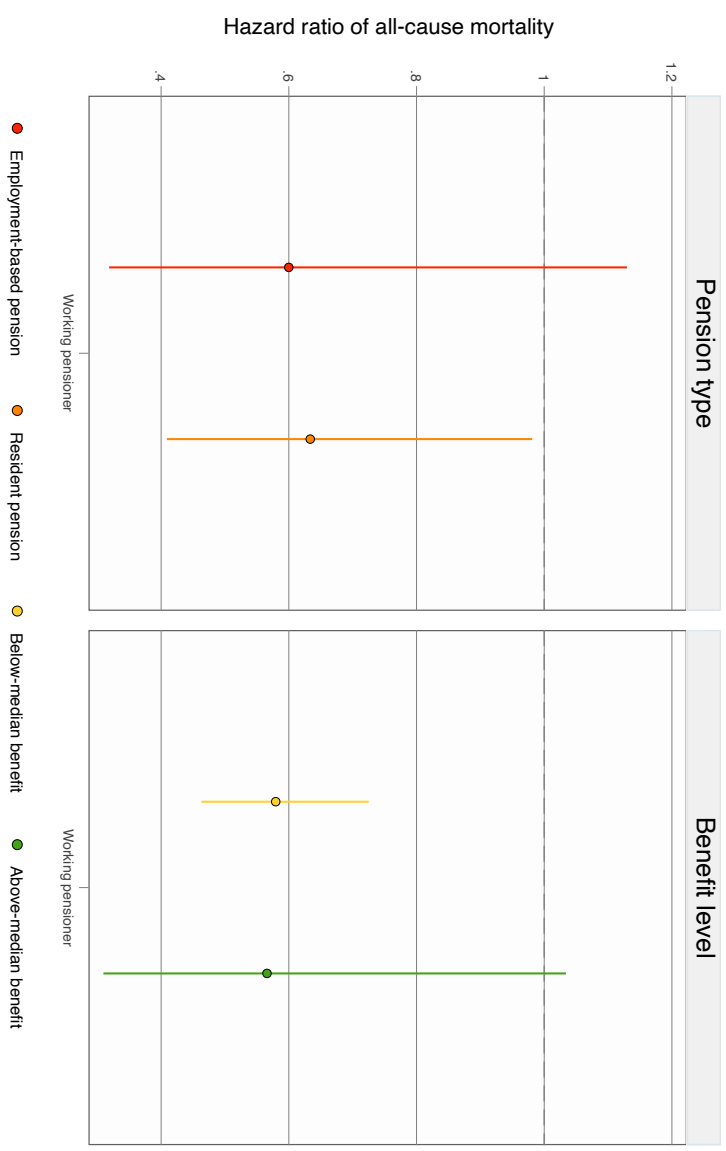


Figure 5.1. Hazard ratios of all-cause mortality for the working pensioner group compared to the not-working pensioner group in China, 2011–2020, stratified by pension scheme and benefit level (Weibull survival model).

Notes: The error bar represents 95% confidence intervals. The models include demographic (age, sex, marital status, area of residence and geographic region), socioeconomic (education, occupation, and household income), and health (self-rated health and chronic conditions) controls.

Supplementary material

Table S5.1 Hazard ratios of all-cause mortality for late-career engagement groups in China, 2011–2020, stratified analysis (Weibull survival model).

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	Female	Male	Middle-aged	Older	Rural	Urban	Illiterate or primary school	Middle school or higher
Late-career engagement								
Inactive non-pensioner	1.49** [1.16,1.92]	1.83*** [1.43,2.36]	1.90*** [1.45,2.49]	1.57*** [1.25,1.97]	1.59*** [1.33,1.90]	1.76** [1.16,2.69]	1.58*** [1.33,1.87]	2.04** [1.24,3.37]
Regular worker	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Working pensioner	0.61** [0.44,0.85]	0.50*** [0.40,0.62]	0.66** [0.50,0.87]	0.56*** [0.43,0.72]	0.53*** [0.44,0.63]	0.47*** [0.31,0.73]	0.51*** [0.42,0.62]	0.49** [0.31,0.75]
Full retiree	0.88 [0.67,1.15]	0.94 [0.76,1.15]	1.11 [0.82,1.51]	0.90 [0.72,1.13]	1.00 [0.83,1.21]	0.78 [0.57,1.07]	0.88 [0.73,1.05]	1.01 [0.67,1.52]
Observations	5,899	6,132	8,379	3,652	7,437	4,594	8,628	3,403
Log pseudolikelihood	-3.93e+07	-5.90e+07	-6.08e+07	-2.97e+07	-5.52e+07	-4.35e+07	-6.80e+07	-2.89e+07

Notes: 95% confidence intervals in brackets. All models include demographic (age, sex, marital status, area of residence and geographic region), socioeconomic (education, occupation, and household income), and health (self-rated health and chronic conditions) controls.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S5.2. Hazard ratios of all-cause mortality for late-career engagement groups in China, 2011–2020, by pension type and benefit level (Weibull survival model).

	Model 1	Model 2	Model 3	Model 4
	Employment pension	Resident pension	Below median benefit	Above-median benefit
Pensioner type				
Full retiree	Ref.	Ref.	Ref.	Ref.
Working pensioner	0.60 [0.32,1.13]	0.63* [0.41,0.98]	0.58*** [0.46,0.73]	0.57 [0.31,1.03]
Observations	1,679	1,011	3,155	1,759
Log pseudolikelihood	-1.64e+07	-8655452.11	-2.17e+07	-1.73e+07

Notes: 95% confidence intervals in brackets. All models include demographic (age, sex, marital status, area of residence and geographic region), socioeconomic (education, occupation, and household income), and health (self-rated health and chronic conditions) controls.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S5.3. Hazard ratios of all-cause mortality for late-career engagement groups in China, 2011–2020, after entropy reweighting (Weibull survival model).

	Model 1	Model 2	Model 3	Model 4
	Later-life employment	Inactive non-pensioner	Working pensioner	Full retiree
Employment and pension status				
Working (Ref. = Not working)	0.61*** [0.54,0.69]			
Pensioner (ref. = Non-pensioner)	0.58*** [0.51,0.67]			
Late-career engagement				
Inactive non-pensioner (ref. = Regular worker)		1.66*** [1.40,1.98]		
Working pensioner (ref. = Regular worker)			0.54*** [0.46,0.65]	
Full retiree (ref. = Regular worker)				1.03 [0.78,1.36]
Observations	12031	7103	7362	7686
Log pseudolikelihood	-4475.25	-1353.37	-1289.26	-1521.44

Notes: 95% confidence intervals in brackets. All models include demographic (age, sex, marital status, area of residence and geographic region), socioeconomic (education, occupation, and household income), and health (self-rated health and chronic conditions) controls. Entropy balancing

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weights were applied. In Model 1, workers and non-workers were matched; in Models 2-4, regular workers and other late-career groups were matched, respectively.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S5.4. Hazard ratios of all-cause mortality for late-career engagement groups in China, 2011–2020, after entropy reweighting (Weibull survival model).

	Base Model	Model 1	Model 2	Model 3	Model 4
Total pensioner sample	Employment pension	Resident pension	Below median benefit	Above-median benefit	
Working pensioner	0.57*** [0.47,0.69]	0.54* [0.34,0.87]	0.66 [0.42,1.03]	0.60*** [0.48,0.75]	0.52** [0.35,0.77]
(ref. = Full retiree)					
Observations	4928	1679	1011	3345	1569
Log pseudolikelihood	-1251.39	-158.97	-303.49	-912.98	-279.81

Notes: 95% confidence intervals in brackets. All models include demographic (age, sex, marital status, area of residence and geographic region), socioeconomic (education, occupation, and household income), and health (self-rated health and chronic conditions) controls. Entropy balancing weights were applied. In all models, working pensioners and full retirees were matched.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Chapter 6

Re-imaging Work and Retirement

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Re-imagining Work and Retirement: General Discussion and Conclusions

In light of unprecedented demographic changes, the workforce is ageing rapidly worldwide. The changes in the landscape of retirement we have seen today and will witness in the future are multidimensional, multilevel, and moving towards different directions. In contrast to what Atchley (1982a) anticipated four decades ago, increasing de-institutionalisation and differentiation will lead to a new era of retirement, a time when old age is no longer characterised by inactivity and disengagement. The evolving landscape of retirement implies that, on the one hand, older workers have more choices in late-career transitions, but, on the other hand, the lack of synchronising individual retirement behaviours with age norms and expectations may lead to divergent destinies in late careers. As Beehr (2014, p.1106) concluded in his reflection about retirement, “*To retire or not to retire is not the question, because retirement is not one thing. Whether to retire is not a true-false or yes-no decision, but instead, it is a multiple-choice decision.*” The multiple-choice decision cannot be made in a vacuum. Although much of the research has endeavoured to identify factors of retirement, various contexts, aspects, and processes of retirement are under-explored (Henkens et al., 2018; Moen, 2012). Therefore, it is important to identify the life course contexts in which older adults formulate their retirement decisions, experience late-career transitions, and adapt to post-retirement life.

In this dissertation, I aimed to investigate the temporal, spatial, and relational contexts of late-life employment or retirement as well as the health implications of late-career engagement in China using nationally representative survey data from the China Health and Retirement Longitudinal Study (CHARLS). I have shown how socio-economic resources at different time points (i.e., childhood, young adulthood, and mid-later years) and levels (i.e., individual, household, and neighbourhood) influence older adults’ decisions over employment and retirement. Focusing on human mobility, I examined to what extent migration history influences bridge employment and how economic opportunity and welfare exclusion may contribute to the nexus between internal migration and retirement. As for the consequences of late-career transitions, I have examined how late-career engagement, especially employment continuity after reaching pension eligibility ages, is

associated with longevity in older Chinese populations of various backgrounds.

To broaden the scope of this research, I will summarise the key empirical findings of previous chapters and discuss these findings and their connections to relevant literature. I will also discuss the overarching implications for theory, policy, and service in broader contexts. Possible limitations of the present research will be acknowledged to provide suggestions for future research on work and retirement, particularly in a non-Western context.

6.1 Summary of Main Findings

6.1.1 Life-Course Temporal Dynamics of Retirement

Life course theory argues that later-life transitions should be understood within a long-term developmental framework (Elder et al., 2003) or a canalisation process (Heckhausen & Buchmann, 2019). While the retirement literature has intensively examined retirement and bridge employment in proximate decision-making contexts, our knowledge about the early origins of retirement decisions is lacking. By locating retirement in life-course temporal contexts, Chapter 2 sought to ascertain the effect of socio-economic dynamics over the life course on later-life employment in urban China.

Four key findings have been found in this chapter. First, it observed that adulthood socio-economic resources were negatively associated with later-life employment, suggesting that resource-related advantages may provide financial incentives for older adults to withdraw from the labour market. This finding is not new in the Chinese context (Giles et al., 2023). However, it contrasts with evidence from the high-income, Western world, where older adults with more resources are more likely to delay their retirements. Starting in 2025, China will implement its retirement age reforms over the following 15 years. The existing pension policies have become a powerful institutional barrier to longer productive lives, especially for older adults of higher status. This finding may indicate that the early exit culture will continue to prevail for several years throughout urban China. However, childhood socio-economic resources were positively associated with employment

in old age. The reason for this finding could be found in social and historical changes in China because all the participants were born in a period characterised by war, political movements, and long-term impoverishment. Especially during the Cultural Revolution, class labels determined access to myriad resources and exposure to potential threats. Resource-rich households were more likely to be targeted by political discrimination and, therefore, may fail to transmit their advantages to younger generations.

The second finding is that life-course trajectories of socio-economic mobility were identified, encompassing two advantaged trajectories (upward mobility and stably high status) and two disadvantaged trajectories (downward mobility and stably low status). Advantaged social mobility trajectories were negatively associated with later-life employment, while no differences were found between downward mobility and stably low-status trajectories. For two mobile groups, young adulthood signifies a critical period of life in which intergenerational mobility unfolded in different directions. The negative effects of upward mobility and stably high-status trajectories in employment are unsurprising because adulthood socio-economic resources affect subsequent life chances, which construct a more proximate resource context of late careers. In contrast, the failure to maintain or gain resources in early careers can cause a long-term negative effect on retirement preparation. From a social mobility perspective, it points to the fact that durable adulthood (dis)advantages can accumulate in later life stages that may need certain attention. Moreover, interventions in adulthood (dis)advantages, ranging from early to late working careers, can reconfigure the opportunity structure of retirement.

The third finding is related to the pension system. I found that the negative effect of socio-economic dynamics on later-life employment emerged mostly after pensionable ages. After receiving a pension income, older adults with more socio-economic resources or from two advantaged mobility trajectories were less likely to work compared to their counterparts of lower status. This finding implies that the pension system could impose stronger incentives on advantaged older adults to discourage them from late-career engagement. Moreover, childhood socio-economic resources were associated with a higher likelihood of later-life employment after pensionable ages, suggesting long-term impacts

of earlier life interruptions (e.g., downward mobility due to class labels and educational movements in the socialist period). The pension system could moderate the relationships between lifetime socio-economic dynamics and later-life employment, making older adults of higher achieved status in adulthood less likely to extend their participation in China's ageing workforce.

It further reveals that financial necessity is a key mechanism that could explain socio-economic inequalities in late-life employment because of pension income gaps, hukou-based access to welfare rights, and family financial needs. Both adulthood socio-economic resources and advantaged social mobility trajectories could increase pension income, indicating growing economic inequality after pensionable ages. Moreover, the effects of socio-economic resources on employment appeared to be more prominent in temporary rural-urban migrants because these older migrants may be more vulnerable and have a greater dependence on labour income. I also examined the roles of family caregiving duties and found that only downward financial transfer was associated with late-life employment. Although low-status older adults provide less financial support to their parents or children, they may feel a greater financial burden when supporting children. Hence, lower-status parents were more likely to work after pensionable ages if they provided their children with financial support.

Overall, this chapter shows how socio-economic resources at various life stages and social mobility trajectories influence later-life employment and how the pension system intervenes in such relationships. The findings demonstrate that retirement is a lifelong process in which earlier life stages can cast a long-lasting effect on later-life employment. It extends the retirement literature by integrating perspectives of social stratification, social mobility, and welfare modification to understand the interdependence of different life stages and the process of social mobility in retirement decision-making. However, this chapter did not pay much attention to the spatial context of retirement where socio-economic resources are ascribed, accumulated, and transformed.

6.1.2 Life-Course Spatial Dynamics of Retirement: Differential Exposure in the Neighbourhood

Throughout the life course, individual roles and social positions are formed in specific spaces and places. The life course theorists have stressed the embeddedness of individual lives in historical time and space (Elder, 2003). Interestingly, when Elder et al. (2003) illustrated the principle of historical time and places, they used younger adults in China's "Sent Down" movement as an example. These cohorts of younger adults are approaching old age now, but we do not know how socio-economic changes, such as urbanisation, neighbourhood development, and internal migration, have impacted their late working lives.

In retirement literature, two key issues on the life-course spatial context of retirement should be addressed. First, we should ask whether, how, and for whom a key place, for example, the residential neighbourhood, affects retirement decisions. Establishing a link between the place and retirement or late-career behaviours requires a deeper look at the retirement decision-making contexts. As Moen (2012) and Szinovacz (2012) have suggested, the broader environment shapes the opportunity structure of retirement. Unfortunately, much of the retirement research tends to be individual-based, without referring to the meaning of the geographic place where older workers live. Second, the spatial dimension of retirement must be considered within a mobility framework. Despite the possible influences of residential places on labour market outcomes, workers have the agency to select the optimal place to work and live. Internal migration from rural to urban areas, for example, represents the active, rational pursuit of better employment opportunities. Hence, we should further address questions regarding the influences of internal migration experiences on late working lives.

Chapter 3 focused on the neighbourhood context of retirement. This chapter integrated the neighbourhood effect perspective into retirement research and hypothesised a non-linear association between neighbourhood socio-economic resources and labour market exit behaviour in mid-later adulthood. The results confirmed the non-linear neighbourhood effect on retirement that older workers were more likely to withdraw from the

workforce when their neighbourhood was either too deprived or too affluent. On the one hand, for older workers in deprived neighbourhoods, limited employment opportunities and low-quality job-related information may restrict their employment ambitions. On the other hand, older workers from neighbourhoods rich in resources may have better retirement security and, consequently, transition into leisure life earlier. The finding implies that different neighbourhoods may breed distinct opportunities and constraints regarding employment and retirement for older workers.

Chapter 3 also shows that older workers can strategically adapt to their neighbourhood socio-economic environments. First, I observed that the non-linear neighbourhood effect on labour market exit was flattened in more advantaged neighbourhoods among older workers with non-agricultural jobs and reversed in non-agricultural self-employed adults. Older workers in non-agricultural employment, especially in more affluent neighbourhoods, may be more likely to develop their career paths and retirement preferences, thereby becoming less dependent on neighbourhood resources. The inverted-U-shaped association between neighbourhood income and labour market exit probability among self-employed adults reflects that both neighbourhood disadvantages and advantages can encourage entrepreneurship. Moreover, the U-shaped neighbourhood effect existed mainly in older workers in agricultural jobs, suggesting that agricultural workers may rely more on neighbourhood resources. Second, Chapter 3 reveals that the non-linear neighbourhood effect was more salient among older workers from lower-income households. In resource-poor neighbourhoods, older workers may be more likely to experience employment penalties, regardless of their household economic conditions. However, in resource-rich neighbourhoods, only those from lower-income households were more likely to withdraw from the labour force.

This Chapter highlights that research on work and retirement must account for the neighbourhood or area socio-economic contexts when studying retirement and late-career decisions. Neighbourhood socio-economic resources can influence individuals' retirement decisions in more nuanced ways. Because residents of lower classes may have a high reliance on their neighbourhood resources, both neighbourhood disadvantages and ad-

vantages increase their transition into retirement. For those having more individual and family resources, living in a well-developed neighbourhood does not necessarily increase the probability of retirement. Nonetheless, neighbourhood deprivation deters continuous workforce participation among older workers, irrespective of their own and family resources. The findings suggest that the neighbourhood plays a crucial role in shaping retirement decisions in China.

6.1.3 Life-Course Spatial Dynamics of Retirement: Differential Reception through Internal Migration

To complement Chapters 2 and 3, I examined whether and how internal migration influences older adults' workforce participation after reaching pensionable ages. The main question I addressed in this chapter was as follows: *whether and how does internal migration history affect bridge employment (working after pension age)?* To answer this question, I first compared migrants and non-migrants and then examined the economic opportunity and welfare exclusion mechanisms that may explain older migrants' retirement decisions in Chapter 4.

The first key finding in Chapter 4 is that internal migration was generally associated with a decreased likelihood of employment after pension age among older adults from the same place of origin in China. In both urban and rural areas, migrants were less likely to work after receiving a pension income. This finding confirmed the economic opportunity hypothesis that internal migration may benefit economic mobility, which could eventually reduce the need for longer working lives. Nonetheless, when comparing migrants and non-migrants across places, I found that urban-origin migrants had a lower likelihood of bridge employment than rural-origin migrants. Urban-origin migrants were an advantaged group who could ascribe their parents' resources (X. Wu & Treiman, 2007) and have privileged access to skill-intensive jobs. In contrast, rural-origin migrants may face more employment-related constraints in China's segmented labour market, especially in big cities. Their disadvantages due to rural origins can persist over late careers and increase their likelihood of bridge employment compared to lifetime urban residents.

Furthermore, economic opportunities were negatively associated with employment after pension age among older migrants. The results showed that migrants who moved in the post-reform era, entered a remote destination, and stayed in urban areas for ten or more years were less likely to engage in bridge employment than their counterparts. As mentioned earlier, Elder et al. (2003) deem that internal migration during the Cultural Revolution period may negatively influence the lives of young adults in China. I also found evidence that internal migration in pre-reform periods may hinder economic mobility and increase the financial need for a longer working life. The market transition since the late 1970s has provided considerable economic opportunities for Chinese people, including migrants. However, we could conjecture that the employment effect of the time of migration may be more complex because older migrants who migrated too late usually experience more social challenges, such as adaptation. Furthermore, the distance of initial migration was relevant for bridge employment because of migration-related costs and benefits. Staying in a familiar and accessible place for extended periods may not benefit economic mobility. Although long-distance migration is associated with more costs, those who have moved to other provinces or regions may access better jobs and accumulate more wealth for retirement. Moreover, the results of the duration of stay showed that a longer period of urban residence could reduce older migrants' employment activities after pension age. Because social and economic integration requires a longer time, those migrants of more extended urban residences may have improved retirement preparations and do not rely on labour income. In general, the findings indicate that migrants who have gained more economic opportunities may be less likely to work longer in China.

Concerning welfare contexts, the results discovered that return migration and rural hukou could increase the likelihood of bridge employment among older migrants in China. Migrants who return to their original places are often portrayed as unsuccessful migrants failing to settle in prior urban destinations. The failure also pertains to welfare exclusion. In China, where social welfare provision is highly decentralised to local authorities, returning from developed regions to less developed hometowns can result in a loss of welfare

rights, including pension benefits. In addition, the result also demonstrates that access to social welfare varies significantly between hukou holders, with rural hukou holders more vulnerable to welfare exclusion. Especially in urban areas, temporary rural-to-urban migrants had a higher likelihood of bridge employment than migrants with an urban hukou status. Here, the results also show that obtaining urban citizenship can reduce the disparities in retirement securities between permanent rural-to-urban migrants and urban-origin migrants. From the results, it is reasonable to conclude that welfare exclusion may increase the need for a longer working life among older rural-origin migrants in China.

To sum up, this chapter uncovered the nexus between internal migration and retirement behaviour by comparing migrants and non-migrants and delving into migrants with different internal migration experiences. The findings of this chapter showed that internal migration could reduce the likelihood of bridge employment, but there was substantive differentiation in migrants. Both economic and welfare mechanisms could help explain older migrants' employment decisions after pensionable ages. On the economic side, internal migration experiences facilitating economic achievements could deter older migrants from extending their working lives. On the welfare side, migrants who experienced more welfare exclusion may be more likely to work beyond pension eligibility ages. Considering the neighbourhood effect on retirement discussed in Chapter 3, the findings on older migrants shed new light on the spatial dynamics of retirement.

6.1.4 Life-Course Inequalities and Divergent Late Working Careers

The three studies on temporal and spatial dynamics reveal that life course inequalities could differentiate late working careers of older Chinese adults. I will illustrate these differences in more detail here. Notably, in China, four typical groups of older people deserve special attention from researchers interested in studying work and retirement. First, rural residents are the most disadvantaged group. The study on internal migration reveals that immobile rural stayers had the highest probability of working after receiving

a pension income, showing a lifestyle of “working until you drop” (de Brauw & Rozelle, 2004). Besides, the chapter on neighbourhood effects showed that rural residents were more susceptible to neighbourhood socio-economic environments. Because China’s retirement policies were originally designed to protect urban employees and revolutionary cadres, rural residents have long been excluded from formal retirement policymaking. Despite the development of resident pension programmes in rural China over the past three decades, the amount of pension benefits and other public transfers remains relatively low among rural residents. Limited economic opportunities and welfare protection create informal retirement in rural China, where older people rely mainly upon family support and savings (Giles et al., 2023). The issue is gaining tremendous public concern because hundreds of millions of rural-urban migrants return home towns and approach old age.

Second, rural-urban migrants represent a unique but heterogeneous social group. In general, migrants can gain more economic opportunities over their life course than stayers of the same origins. However, rural-urban migrants are more disadvantaged than urban-origin migrants in terms of economic integration and retirement preparation. This thesis indicates that various features of migration could create within-group inequalities among older migrants. For example, late-life employment behaviours of temporary rural-urban migrants were more affected by socio-economic resources than permanent rural-urban migrants. In the ageing workforce, especially in urban China, older rural-urban migrants are found to be more likely to continue to work (Q. Zhang & Wu, 2023). It indicates that welfare exclusion due to fragmented retirement protections may force disadvantaged older migrants to work longer. Retirement insecurities compounded by employment precarity could significantly elevate migrants’ social and economic disadvantages, affecting their well-being in later life. The study calls for more attention to older migrant workers who may be highly invisible in policy discourse. To support older migrants, the government should expand urban citizenship rights to various migrants by reforming the hukou system, removing migration and settlement barriers, and promoting equal access to employment and welfare.

Third, low-status urban residents may experience retirement insecurities due to life course disadvantages. The study on life-course dynamics found that downward mobility and stably low-status older residents were two disadvantaged groups in urban China. Low-status adults, especially those who failed to gain a better education and initial occupation in younger adulthood, may be more vulnerable to career-related risks, such as low pay, unemployment, and frequent job mobility. These workers have greater difficulties accumulating economic resources for retirement, leading to higher odds of late-life employment, especially after pensionable ages. Given the expansion of the informal economy and the flexibilisation of labour markets, low-status workers may develop more worries about their retirement securities. Especially in China, recent economic downturn and demographic changes have raised concerns about old-age pensions. As a result, a declining willingness to pay for their social pension insurance has emerged in younger cohorts facing employment precarity. From a life course perspective, the influences of growing employment uncertainties among low-status workers can be long-lasting. Policymakers are advised to address employment-related vulnerabilities for low-status workers, strengthen their trust in the pension system, and improve their retirement security through reforms targeted to lower socio-economic groups.

Lastly, high-status employees tend to have privileged retirement protections and are less likely to work beyond pensionable ages in urban China. This thesis showed that high-status workers can acquire and accumulate more socio-economic resources over working careers. Their advantages have long roots in early life, especially during the transition into adulthood. In China, I observed that urban residents who experienced upward mobility, remained at stably high status, or held a non-agricultural hukou status were less likely to work after reaching pensionable ages. Because the urban employee basic pension programme has a higher replacement rate in formal sectors, advantaged urban workers have lower odds of working at advanced ages. The early exit of high-status urban workers can not only cause a tremendous waste of human resources but also increase the burden of the pension system. Traditionally, retired civil servants and public institution employees represented a privileged pensioner class who could receive generous retirement

income fully financed by public expenditure. Although the pension programmes for urban employees have been integrated into a unified plan, the long-standing inequalities between occupations and sectors cannot be removed over the short term. Retirement reforms should encourage the extension of working lives among urban workers, especially high-status older groups, by advocating for productive and meaningful engagement in society.

6.1.5 Health Effects of Late-Career Engagement

From the preceding chapters, we have known that full retirement may signify a privilege in China because older adults with more individual socio-economic resources leave the workforce earlier in their mid-later years (for example, before or at age 60) than disadvantaged older adults. While more disadvantaged older adults tend to delay their retirement, it remains uncertain whether these adults can benefit from continued employment compared to other groups. If employment provides non-financial benefits for older workers, such as lower mortality risk, retirement reforms encouraging longer working lives could reduce ageing-related inequalities. Nonetheless, previous findings on employment, retirement, and mortality remain inconclusive because the increasing complexity of late-career engagement can blur the boundary between retirement and employment (Hershenson, 2016).

Chapter 5 examined the associations between employment, retirement, and all-cause mortality in China. One of its major strengths is that this chapter proposes a straightforward typology of late-career engagement by considering the intersection between employment and pension eligibility. I categorised older people into four groups: inactive non-pensioners, pre-retired workers, working pensioners, and full retirees. The results supported the protective effect of employment because older workers had a lower risk of all-cause mortality than non-workers. This longevity premium of employment exists in older populations worldwide, including China, indicating that productive engagement in society through employment is beneficial for health in general. It further provides new insights into the mortality risks of different late-career groups. Before receiving a pension income, inactive participants had a higher risk of all-cause mortality than workers. This

effect suggests that unemployment or premature labour market exit may be detrimental to older adults in terms of survival. Nonetheless, after being entitled to pension benefits, older workers who extended their working lives had a lower risk of all-cause mortality than pre-retired workers and full retirees. Consistent with the continuity theory, employment continuity could benefit the health and survival of older people in China.

There were gender and age differences in the longevity premium of employment continuity. Although the literature suggests that people of older ages may benefit more from delayed retirement, my results showed a distinct pattern that the negative association between employment continuity and all-cause mortality weakened with ageing. This could be explained by the fact that, in China, the health benefits of working at advanced ages may be reduced by the lack of age-friendly work environments and increased health concerns. Regarding the gender differences, I observed that older men may capture a greater longevity premium of employment continuity than women workers. Nonetheless, the male advantage in the workplace should not be exaggerated because the gender difference may be small.

Socio-economic inequalities in the mortality risks of late-career engagement warrant attention, too. The results showed that full retirement was only associated with a lower risk of all-cause mortality in urban areas. Given that urban residents usually exit the labour market early, the finding may raise questions for policymakers aiming to promote longer working lives in urban China. These retirees who have already withdrawn from the workforce may have more opportunities to engage in leisure and physical activities. Their pre-retirement resources, in combination with pension incomes, could ensure their health and well-being in retirement. If policymakers attempt to change the retirement landscape, they must carefully consider the voices of advantaged urban residents. I also found that the longevity premium of employment continuity was larger among older workers with a moderate or higher level of education. In China's segmented labour market, better-educated older workers may have better access to quality, skilled employment that could realise their late-career goals because they have more human capital. Hence, older workers with more education may accumulate more health-related benefits in the workplace.

Chapter 5 also provides a deeper investigation into the longevity premium of employment continuity by considering the heterogeneity within older pensioners. The results corroborated the leveller hypothesis that the negative association between employment continuity and all-cause mortality is stronger among working pensioners with insufficient retirement protections. I found that the longevity premium of employment continuity was larger among those enrolled in resident pension schemes and receiving a below-median pension income. The findings imply that working beyond pension eligibility ages could function as a leveller that reduces later-life inequalities in life expectancy between older people of different pension schemes and pension benefit levels. Nonetheless, more research is needed to investigate how employment continuity may influence the health and well-being of older people in various employment and occupational contexts.

In sum, Chapter 5 revealed the associations between late-career engagement and all-cause mortality among older Chinese adults. The findings showed a consistent and robust pattern that employment continuity was associated with a lower all-cause mortality risk. Labour market exit before receiving pension incomes was associated with a higher all-cause mortality risk. The longevity premium of employment continuity was socially stratified, showing discernible demographic and socio-economic disparities. In particular, the findings underscored a levelling effect that working pensioners with insufficient retirement protections could gain more survival benefits from extended working lives. Echoing previous chapters, Chapter 5 promisingly suggests that delayed transition into retirement, or simply working longer, could benefit the health and survival of older people, especially those with inadequate retirement securities.

6.2 Implications for Theory and Research

The present research made four key contributions to the literature on work and retirement. The first theoretical contribution has been achieved by uncovering the temporal contexts in retirement decision-making. My inquiries into the roles of lifetime socio-economic resources and internal migration history enrich our understanding of retirement

as a life-long project (Moen, 2012). This idea that retirement, as a later-life transition, must be located in the long-term process of life course development stems from the life course theory (Elder et al., 2003). My Chapters 2 and 4 suggest that life conditions (such as socio-economic resources and social mobility) and life events (such as internal migration) in earlier life stages could influence labour market behaviours in middle and late adulthood. This finding complements the literature by suggesting that exposure to early-life socio-economic conditions may be more prominent in some groups due to social and demographic changes. In retirement research, however, the importance of the life-course temporal context warrants more scholarly attention. Ekerdt (2004, p.3) ever contended, “*Retirement is no longer a concern solely for the second half of life. Rather, the idea that we will someday retire is increasingly present to all adults and it is even urged on adolescents.*” It will be valuable for future researchers to discover how younger adults perceive their future retirement and how life experiences at various life stages shape the timing and routes of retirement as well as retirement adjustment quality in different institutional settings.

Through two chapters investigating the roles of neighbourhood socio-economic resources and internal migration, my research also brings the place back into the retirement literature. This is the second theoretical contribution. Chapter 3 represents a pioneering effort to link neighbourhood socio-economic resources to retirement behaviour. Resonating with the neighbourhood effect literature (G. Galster, 2001), the findings suggest that the associations of neighbourhood income and education with labour market exit probability are non-linear. The research provides rich insights into late-career decisions in the neighbourhood contexts and will serve as a key reference for future research on work and retirement that inspects how place matters for older workers. Moving beyond the neighbourhood, I also contribute to the retirement literature by theorising the influences of internal migration on late-life employment in Chapter 4. This chapter touches upon an under-explored social issue in China and many other regions, namely the retirement of internal migrants. As of now, much of our knowledge about migrants is concerned with international retirement migration. The findings of Chapter 4 provide a timely

sketch of internal migration biographies and older migrants' retirement choices in China. Focusing on the neighbourhood and migrants in Chapters 3 and 4, I addressed issues that Browning et al. (2016) call “differential exposure” and “differential reception” when studying the roles of places in the life course. The two chapters have extended retirement research to the spatial context, making the meaning of place more substantive and situational. I encourage future researchers to pay more attention to how different types of places and life-course changes in places influence labour market outcomes among older people. Again, I would also like to emphasise that temporal and spatial dynamics are often intertwined with each other to shape late working careers. Although neighbourhood deprivation may restrain labour market outcomes, internal migration represents the life-course agency of individuals. In the long term, individual agency and structural constraints construct our life courses jointly. Therefore, future theoretical development could simultaneously consider the temporal and spatial processes over the life course and explore how the interplay between individual agency and social structures influences late-career behaviours.

Third, this research advanced our understanding of the roles of the pension system in shaping late-career choices. The life course theory and cumulative (dis)advantages perspective suggest that social policies could shape socio-economic inequalities over the life course (Dannefer, 2020; DiPrete & Eirich, 2006; Leisering, 2003). My research indicates that the pension system generates a negative effect on late-life employment by incentivising older workers with better retirement protections to retire early or on time. This finding is nothing new because the primary goal of the pension system is to secure life in retirement and reduce poverty risks. However, it shows a sharp contrast with what we have learned from mainstream rhetoric of work and retirement. The evidence from Western, high-income countries shows that although pension eligibility foreshadows a retirement life, growing shares of pensioners re-enter the workplace (Cahill et al., 2017; Fideler, 2020; Maestas, 2010; Platts et al., 2019). Many Western researchers view paid work after pension eligibility ages as a new stage of late careers that fulfils career and life goals other than financial necessity (Cahill et al., 2017; Platts et al., 2023). Here, I provided new

evidence of how retirement protection systems interacted with socio-economic resources in influencing retirement decisions in Chapter 2 and how pension eligibility interacted with workforce participation in shaping later-life health in Chapter 5. Working longer in China at this stage is largely driven by socio-economic restrictions and unequal pension support. The main finding of Chapter 2 is that the negative associations between adulthood socio-economic resources and late-life employment become stronger after receiving a pension income. This could be interpreted as the differential retirement incentives provided by the pension system. Because workers of lower classes are often excluded from the employment-based pension programmes and experience greater employment-related risks in the labour market, financial strain in mid-later adulthood could be exaggerated by their lower level of pension incomes. Consequently, the pension system accentuates rather than reduces inequalities in late-career decisions, especially after reaching pension eligibility ages. Chapter 5 further provides a more comprehensive picture of pensioners. The findings of this chapter suggest that older adults of lower socio-economic status are more likely to delay their retirement in China but, in return, gain more survival benefits from employment. The two chapters complement each other and show that the inherent inequalities in the pension system promote extended working lives among disadvantaged groups, which, in turn, could improve their life expectancy. Future research needs to further explore the influences of the pension system on late careers and retirement well-being. Methodologically, the typology of late-career engagement based on employment status and pension eligibility could be further extended in future research. For example, this topological approach can easily be adapted to assess career quality (O'Rand, 1996). It is also worth investigating how older workers of different pension schemes prepare for retirement and cope with financial situations before and after retirement transitions.

Last but not least, this research provided new insights into the social inequalities in late careers. Given the decreasing significance of mandatory retirement policies worldwide, the heterogeneity and inequality in retirement and late careers are expected to increase. In China, I have provided several exemplary analyses of social inequalities in retirement that touch upon socio-economic resources at various life stages (i.e., from

childhood to mid-later years) and multiple organisational levels (i.e., from individual to neighbourhood levels). From a temporal perspective, social inequalities in retirement could be produced, accumulated, and consolidated throughout the life course. From a spatial perspective, retirement-related inequalities are formed in social spaces within and outside the workplace. The present research suggests that the conjunction of temporal and spatial processes of social inequalities may generate a compounded effect on work and retirement. For example, return migrants with lower levels of human capital (e.g., education) in rural areas are likely to work beyond pension eligibility ages. In light of the recent emphasis on social stratification in retirement (e.g., Radl, 2013; Turek et al., 2024), my research moves towards a closer identification of the temporal and spatial processes that produce inequalities in late careers.

6.3 Implications for Policy and Service

The present research has important implications for public policy and social services. Concerning policy implications, three key lessons could be drawn from the findings. The first lesson for public policy is that the policy-making process should incorporate a life course perspective to address issues regarding work and retirement. My research findings have shown that retirement and late-career behaviours have deep-rooted origins in the spatial and temporal context over the life course. The inability of labour market policies to recognise the importance of previous life experiences, such as education, employment, and internal migration in young adulthood, for long-term career outcomes could lead to accentuated inequalities in later life, especially during retirement transitions. To minimise retirement-related inequalities, policymakers are recommended to support the educational attainment and career development of younger adults because accumulating socio-economic resources in adulthood could reduce or eliminate the direct effect of social origins and promote upward social mobility. A life course perspective also implies that policymakers should move beyond the traditional tripartition of the life course (Kohli, 1986) to create a new, flexible life course regime that supports career development in

encore adulthood (Moen, 2016).

The second lesson relates to resource building for older workers. As shown by the findings, resources are multi-dimensional and multilevel. Individual and family resources accumulated at the time of retirement could increase older workers' independence and enhance their retirement security. Neighbourhood socio-economic deprivation could restrict late-career engagement among older people, except for non-farm self-employed adults. Hence, policymakers could provide employment-based support to older workers, especially from low-income strata, deprived neighbourhoods, and rural areas, to improve their employment security, enhance their health capacity for work, and promote preparations for retirement and/or extended working lives. Apart from the supply side, employers could be offered incentives, such as taxation deduction and monetary allowance, to expand the recruitment of older workers through internal or external channels, build age-friendly work environments, provide flexible retirement options, deliver on-site training programmes for older workers, and support successful ageing at the workplace. Employment-related impediments, such as labour market segmentation, welfare exclusion, and mobility restrictions, can be removed gradually through policy and legal efforts that promote an inclusive and open labour market that provides numerous economic opportunities for older people (Jensen, 2024). Public policies should also target disadvantaged older people, who are willing to work but remain inactive involuntarily or work at low-quality jobs, to improve their access to better employment opportunities. For example, providing job-related information and enriching employment skills through job centres and digital technologies, may expand labour market opportunities, .

Third, deliberate policy reforms should be designed to reverse the dominant early exit culture and encourage prolonged working lives, especially in China and other developing regions. Current retirement reforms in China are encouraging older workers to delay retirement gradually and voluntarily in the following decade, from 2025 to 2035. To maintain societal stability while catering to the diverse needs of the working population, China has no plans to block early exit routes (i.e., retirement before age 60) and will not raise statutory retirement ages universally. China's labour market will take a long time,

probably a decade or two, to fully move towards a late retirement arrangement. This study has shown that disadvantaged older people, including rural-origin older migrants, have a greater economic necessity for late-career engagement, especially after pension eligibility ages. It could be conjectured that the influences of China's retirement reforms will be more prominent in low-status workers in precarious or non-standard employment. With the development of an ageing workforce and the diffusion of public and organisational policies supporting late retirement, more flexible retirement options and diverse bridge employment opportunities will be released. These workers will benefit from appreciable improvements in retirement security (Cahill et al., 2024) and health preservation (as shown in Chapter 5).

Nonetheless, the deep-rooted, prevalent early exit culture appears unlikely to abate soon and can inevitably dent progress on China's retirement reforms. According to my research, I advise policymakers in Chinese central and local governments to carefully deal with gender gaps in retirement timing, inequalities in retirement protections, and ageism toward older people. Reducing gender gaps in normal retirement age could be one of the key policy initiatives. In China, the normal retirement age for both blue-collar and white-collar women workers needs to be increased gradually, encouraging older women to accumulate more pension wealth before labour market exit. Improving female employment can be especially difficult in some patriarchal societies that rely heavily on women to provide informal care. Local governments could introduce more favourable policies to support women carers by enhancing the balance between care responsibilities and employment. These policies could include expanded coverage of formal childcare services, enhanced provision of old-age support, and the promotion of a family-friendly labour market.

Moreover, policy interventions should endeavour to reduce social inequalities in retirement protections. Within and outside the ageing workforce, older people are a vulnerable group affected by pre-existing labour market segregation and emergent inequalities induced by the pension system and retirement transitions. Concerning retirement transitions, the government should reduce the inequalities in retirement protections, especially

pension benefits, between social groups. Despite the unification of pension programmes, older people of lower socio-economic status may face greater retirement insecurities and poverty risks. The government should reduce welfare exclusion in old age by expanding equal access to welfare rights. Policymakers must improve the coverage of public and private pensions, reduce the gaps in benefit levels of different pensions, and provide additional pension allowances for older people with insufficient retirement protections, especially rural residents and rural-origin migrants. The civil pension programmes in the public sector are recommended to be fully integrated into the defined-contribution basic employee pension schemes to reduce gaps between different sectors. Additional pension-related allowance could be associated with the type and length of employment before and after retirement, offering special assistance to more vulnerable workers. Besides, social exclusion faced by vulnerable older groups, especially low-status workers and rural-origin migrants, could be reduced by promoting social participation and welfare integration.

Lastly, policy reforms raising the retirement age and promoting longer working lives must be accompanied by societal efforts that create a new discourse about older workers and reduce ageism against older people. Since the outbreak of the COVID-19 pandemic, older workers may experience more age-based discrimination in the workforce and face greater retirement saving losses than younger workers (Morrow-Howell et al., 2020). China's recent surge in youth unemployment has intensified intergenerational antagonism towards older workers, although there is no solid evidence showing that older workers crowd out youth employment opportunities (Kalwij et al., 2010). To achieve long-term retirement reform goals, policymakers in China and beyond must combat prevalent ageism while fostering intergenerational solidarity through proactive life-course employment policies and public education interventions.

For social service providers, two key implications could be valuable. First, social service programmes should be designed and implemented to address the various needs of older workers. In the ageing workforce, older workers, especially those who work beyond full pension ages, typically experience deteriorated job quality and increased health-related worries. Social service organisations are encouraged to collaborate with local gov-

ernments and enterprises to identify older workers' service needs and design sustainable programmes or interventions to support the ageing workforce. These programmes could be specialised to address overlooked issues for older workers, such as labour rights, hidden health problems, internal recruitment, as well as skill training. These interventions can also be tailored to employers from different sectors to improve age management in the workplace by promoting age-inclusive human resource management and organisational climate. To achieve this, social service workers can help employers design employee assistance programmes that improve the psycho-social capabilities, health, and well-being of older workers.

Second, community-based social service providers could promote productive ageing and support the development of age-friendly communities for older residents. For mid-life adults of lower status, social service workers should encourage them to stay productive and increase their career-related skills by providing employment-related information and career counselling services. To support older workers, social service workers could design and deliver retirement planning programmes to promote their preparedness for later life and reduce their financial strain. Because older workers may worry about retirement in multiple life domains, including finance, health, mental well-being, and social life (C. Liu, Bai, & Knapp, 2021), social service providers should recognise the importance of multidimensional retirement planning. Social service workers can collaborate with local employment service organisations to deliver retirement planning training courses and counselling services to encourage older workers to proactively cope with ageing-related changes and identify optimal late-career pathways through active and early preparations for retirement.

Community-based programmes could be expanded to various older groups to mitigate unemployment risks, raise public awareness of late-career engagement, eliminate age-related stereotypes and norms that deter economic activities in old age, and mobilise older workers to form peer support groups. All households, especially those with older family members, will benefit from these services that enhance economic independence and social inclusion.

6.4 Limitations

The current research must acknowledge its limitations here. First, I did not adopt a life-course trajectory perspective to categorise and compare retirement sequences. Existing research employing a person-centred approach has shown that retirement in the US has not fully de-standardised and the level of de-standardisation varied substantially across social groups (Calvo et al., 2018). Using cluster analysis techniques, such as sequence analysis, can help identify distinct retirement pathways and examine the complex process of late-career transitions. However, these approaches require high-quality life history data and produce solutions specific to data and samples. In the earlier stage of my dissertation development, I tried to profile the typologies of late careers in China. Unfortunately, preliminary results of sequence analysis and hierarchical clustering could not fully differentiate different retirement patterns because China has a complex retirement system. Although I also tried to limit the sample to only urban residents, I realised that migrants from rural areas could complicate the urban landscape of retirement. After restricting the sample to urban natives, I found that most urban-born workers retired at or before 60, showing no appreciable trend toward extended working lives. As a result, I decided to concentrate my attention on retirement decision-making rather than the retirement transition of certain advantaged groups in urban China.

Second, the focus on the general older populations restricted my attention to occupational segregation and work conditions that may affect retirement decisions. I unpacked certain influences of occupation on late careers and retirement in this dissertation. For example, in Chapter 3, I assessed the interplay between occupation and neighbourhood socio-economic resources in shaping retirement decisions. At the same time, it is necessary to note that China's pension systems are closely connected with occupation. For example, the resident pensions in rural areas cover rural residents who engage in agricultural self-employment and farm-based employment. When it comes to older migrants from rural areas, a vast majority of them participated in resident pension plans in their rural hometowns. In urban areas, participants enrolled in resident pension plans are typically low-income, temporary migrant workers, and self-employed residents. Therefore,

pension schemes could serve as a proxy for pre-retirement occupation in China. Nonetheless, I did not pay much attention to the occupational and work conditions because I focused more on the general older population rather than specific worker groups. Future research is encouraged to ascertain the influences of occupational, sectoral, and organizational characteristics over the work course on retirement decisions and post-retirement well-being.

Third, the study could not evaluate the influences of retirement reforms on older workers' labour market behaviours and post-retirement adjustment, although I expected to connect my research to existing policy changes. The primary reason for this limitation is that there were no significant changes in China's retirement age policies over the past decade. At this stage, all my analyses were based on data irrelevant to any progressive retirement age reforms as seen in Western countries. This limitation does not invalidate my findings on retirement decisions in China. Because China's recent reforms will raise retirement ages at a pretty slow pace, the shift to a late-exit arrangement cannot be achieved in the following decade. The interpretation of my findings should bear in mind this limitation and avoid overstatement. Future researchers aiming to carry out policy evaluations could collect more longitudinal data before and after raising retirement ages and examine the variations in the responses of both employees and employers toward delaying retirement.

Lastly, with a primary focus on the temporal and spatial context of retirement, I did not discuss the family context much. The role of family in retirement decision-making has been extensively examined over the past two decades. In one study, I reported findings on the effect of parenthood, including the number and sex composition of children, on late-life employment (S. Zhou, 2024). In another study, I examined the influences of intergenerational relationships on older Chinese adults' attitudes toward retirement life (C. Liu et al., 2022). Although the parenthood penalty and intergenerational dependence may persist over late working careers in China, these issues may go beyond my current scope of inquiry and could be addressed by separate analyses. I advise future research to consider employment and retirement as a family strategy involving long-term

negotiations between older couples and their children, as well as dynamic reconciliations between work and care duties. For example, it is worth investigating how living arrangements and intergenerational exchanges affect late-career decisions among older parents in deprived neighbourhoods. Regarding older couples, researchers could further explore how older migrant workers and their spouses negotiate retirement decisions and navigate late careers. Because the relational process of retirement unfolds in specific temporal and spatial contexts, more scholarly attention should be directed to investigating how these life-course mechanisms jointly, rather than independently, determine life chances in late careers.

6.5 Conclusions

This research examined the life-course contexts and consequences of retirement in China. I conducted four empirical studies using population-based cohort data from the China Health and Retirement Longitudinal Study from 2011 to 2020. The first study showed that adulthood socio-economic resources, especially in adulthood, were negatively associated with later-life employment. In the second study, I found that the relationship between neighbourhood socio-economic resources and labour market exit was non-linear and could be moderated by individual and family resources. Focusing on internal migration, the third study showed that older migrants were less likely to work longer than non-migrants in the same originating places while rural-origin migrants were more likely to work than urban-origin migrants. It also showed that economic opportunities and welfare exclusion could explain older migrants' employment decisions beyond pension age. The last study revealed that employment, especially employment continuity beyond pension eligibility ages, could reduce the risk of all-cause mortality. The findings offer a comprehensive understanding of retirement in context and provide valuable venues for future research on work and retirement, ageing policies, and social services that support the ageing workforce and promote retirement well-being.

Chapter 7

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