Intergenerational Transfers and Well-Being in Old Age in Contemporary Urban and Rural China

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Abstract

China is entering a new historical era that has as its demographic hallmark an ageing population. The fact that China is ageing before it becomes a modernised, wealthy country, presents serious challenges, one of the most direct and important of which relates to support for older members of society. This thesis concerns the way in which different factors affect intergenerational transfers from adult children to their old parents, with particular focus on living arrangements and parental income. The core question this thesis aims to address is: If public transfers increase, would this crowd out private transfers? The results of the estimated association between living arrangements and intergenerational transfers are also used to improve the robustness of the test of crowding-out effect. This study is based on empirical analyses of two waves of nationally representative datasets, covering adult individuals aged 60 and over from 20 provinces in urban and rural China.

Living arrangements are vital to intergenerational transfers and welfare in old age, especially in China where the family-based support mechanism by which the young cared for the old was traditionally through coresidence. The descriptive statistics show that though coresidence is still the predominant living arrangement in rural areas, older Chinese people are increasingly less likely to co-reside with children. Such changes in living arrangements, however, do not leave older people isolated over time. Investigation of the determinants of older people's coresidence decisions shows that older people with more financial or instrumental needs are more likely to live with children. Analysis of the determinants of parents' living distance from children finds that in urban areas, old parents with higher pensions are more likely to live far away from children, although insignificant effects are found for rural samples. Finally, this study finds weak evidence that parents living far from children receive more intergenerational transfers.

Overall, it has been found that family support, including intergenerational monetary transfers, is still prevalent in China; particularly in rural areas. Although a pattern of declining intergenerational transfers began to emerge during the period between 2000 and 2006, the family unit, and traditional family support, appear likely to remain an essential pillar of security in old age. Through the use of a variety of quantitative methodologies this thesis is able to provide robust estimates of how the increase in public programmes is influencing private transfers in China. Analysis of the factors that determine the incidence of receipt of transfers from children suggests that intergenerational transfers in China tend to target old parents that are in greater financial need. Moreover, the analysis of determinants of the size of transfer suggests that although altruism and exchange motives co-exist, the exchange motive dominates inter-generational transfers in urban China. This study does not find statistically significant estimates of transfer derivatives for older people in rural areas. The emerging pattern of support for older people indicates the pursuit of a new balance between formal and informal support. This thesis argues that a gradual increase in public transfers will not crowd out private transfers, and, in cities, may actually strengthen private transfers.

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Chapter 1: Introduction

> *"While numerous Western countries first experienced cultural rationalization, next economic modernization, and then faced the challenges of population aging and pension policy reform, both Latin America and China, in contrast, are dealing with these challenges in the context of much less developed economies and stronger traditional cultures."* (Calvo & Williamson, 2008)

Private inter- or intra-household transfers are very common in developing and developed countries. These transfers, both in terms of money and time, have long been recognised as playing an important role in resource redistribution and in helping to smooth out consumption over the economic life cycle. Intergenerational transfers between old parents and adult children account for a major part of private transfers, and take two basic forms: from adult children to old parents (upward transfers) and from old parents to adult children (downward transfers). The significance of upward intergenerational transfers in developing countries cannot be overstated, because they represent the most important source of old age support in such transitional economies (Sloan, Wang *et al.*, 2002). This is particularly true in China, where traditionally, adult children, especially eldest sons, serve as the primary source of support for older people, with minimal government interventions.

Set in the context of an ancient history which has been characterised by the dominance of Confucian teachings, the Chinese family has come to function as a close-knit social unit from which its members draw on each other's resources for meeting physical, social and psychological needs (Chow, 2001). Max Weber, one of the first Western sociologists, focused on Chinese society by distinguishing European modernization from that of China. Among a number of factors, the most important difference Weber emphasised was between European Protestantism and Chinese Confucianism. He defined the nature of Confucianism as:

> *"adjustment to the world, to its orders and conventions. Ultimately, it represented just a tremendous code of political maxims and rules of social property for cultured men of the world."* (Weber, [1915] 1951, p. 152)

Confucianism teaches people to accept things as they are and promotes a contemplative and passive attitude that tends to prolong ancient traditions. Family obligations have a special weight in Chinese (or even Asian) societies, with Confucian moral principles providing a strong ideological basis for filial piety and the status of the aged (Chen & Adamchak, 1999). In its contemporary meaning in Chinese, filial piety generally involves the provision of monetary support and care, and the showing of respect and obedience to parents (Ng, 2002; Ng, Loong *et al.*, 2000).

Today, demographic ageing, and with it the associated problem of providing for the well-being of older people, is taking place around the world. This has given rise to concerns among both policymakers and scholars about the sustainability of family support for older people. In addition, because the population ageing process is occurring much faster in developing countries than has been the case in developed countries, it suggests that it may be more important to study intergenerational transfers in the context of the developing world. Among developing countries, China is ageing even faster than others; primarily because of its birth control policy. Intergenerational transfers and the well-being of older persons in China have become crucial issues, attracting increasing attention from academics. These issues have arisen not only because China has limited resources with which to cope with the issue of an ageing population, but also because of the worry over whether social and economic changes will erode traditional family support mechanisms and challenge intergenerational relationships.

There is no clearly defined age of an "old person", which varies considerably across societies and depends on economic development, life expectancy, and some other societal factors. In general, an “old person” is defined as somebody aged 65 or over in more developed regions (MDRs), while it refers to people aged 60 and over in less developed regions (LDRs). The First World Assembly on Ageing[1] held in 1982 defined “old age” as 60 years old or over and the United Nations identifies individuals who have reached the age of 60 years as “older persons” (United Nations, 2005). Currently, the *Law of the People's Republic of China on Protection of the Rights and Interests of the Elderly*[2] refers to the aged as citizens over the age of 60. Therefore, unless otherwise specified, "older persons", "older people" or "old parents"[3] here refer to people aged 60 years or over.

1.1 Modernisation vs. Confucianism

Although it does not show explicit evidence of a causal relationship, and is not empirically testable, modernisation and ageing theory provides broad propositions to explain the general decline in family support for older persons (Aboderin, 2004). Burgess (1960) was the first to propose the theory, with analyses based on data in five Western nations (France, Italy, the Netherlands, the United States of America and the United Kingdom). In the early 1970s, Cowgill refined the notion of modernisation and ageing into a formulaic theory, on the basis of data analyses from 15 different societies (Cowgill, 1974; Cowgill, 1986; Cowgill & Holmes, 1972). The theory proposes that during the process of modernisation, old parents will experience a decline in financial and other

[1] See http://www.un.org/es/globalissues/ageing/docs/vipaa.pdf.
[2] This Law was approved at the 21st meeting of the eighth National People's Congress on August 29, 1996 and went into effect on October 1, 1996.
Available at: http://www.china.org.cn/government/laws/2007-04/17/content_1207404.htm
[3] I do not use the word "older parents" to refer to all parents aged 60 and over because it may confuse the descriptions of age effect when I present the results of multivariate analyses. For example, if I state “older parents are more likely to receive monetary transfers from children”, “older parents” could refer to old parents in general, or parents who are more aged than others.

family support and an increasing need for public support (Burgess, 1960). The process of modernisation involves a shift from agriculture to industry, migration from rural areas to cities, and a shift from extended to nuclear family household size (Goode, 1963). According to the theory, all these changes are inimical to the traditional privileged position of older people, eventually leading to a decline in family old-age support. Burgess argues:

> *"the older person… can no longer count as a matter of right and of moral and legal obligation on economic support by his children. He is less and less likely, if needed, to be offered a home by a son or a daughter. If ill, particularly with a chronic ailment his children are more and more likely to shift his care to a hospital rather than to provide a bed in their home. If lonely, he must more and more look elsewhere than to his descendants to provide companionship and sociability. In short he must seek elsewhere for the satisfaction of his needs – financial, health and social. In Western cultures he turns to the government or other organisations."* (Burgess, 1960, p. 17)

In the Western world, modernisation theory offers a more sophisticated explanation of what had been found by Booth's (1892, 1894, 1899) 19th century surveys, which suggested that there was extensive and increasing poverty among older people resulting from the decline in family financial support. Such a decrease in family support was found to be more significant in urban areas in industrialising regions such as the UK and the US. This issue of widespread old age poverty finally led to the founding of pension systems in these regions in the early 20th century (Shanas, Townsend *et al.*, 1968).

The modernisation, or westernisation, process in China can be traced back to the mid-19th century, when China lost two Opium Wars to the United Kingdom and France. Subsequently, European modernity was imposed during the late Qing dynasty, driven by the imperatives of foreign policy. Industrialisation continued accelerating after the founding of the People's Republic of China in 1949. Since 1976, a dramatic programme of economic and technological reform began, designed to rapidly accelerate economic development by embracing western technology and production models. This programme of reform, which came to be referred to as the *Four Modernisations*[4], and which comprised modernisations of agriculture, industry, national defence, and science and technology, was first introduced in 1963 by Zhou Enlai[5], and launched in 1978 by Deng Xiaoping[6]. Significant changes have been wrought in Chinese economic and social structure since then, and have even deepened since the announcement of the economic reform programme (*gaige kaifang*, meaning reform and opening up to the outside world) which has aimed at attracting foreign investment.

Up until the 1980s, China had limited contacts with the West. But from the beginning of the 1990s China began to enter into the global political-economic system. Interactions between China and the West became more and more frequent, with China joining the WTO, hosting the Asian Games, the Olympic Games and the World Expo. Dramatic economic development, together with increasing involvement in the international system, has placed traditional Chinese society in the direction of a transitional and westernising trajectory. Both old parents and adult children, who have long held dominating and dominated positions in the Chinese family respectively, appear to be experiencing significant changes in those functions and rules.

Critics point out, however, that modernisation theory may fail to predict changes in intergenerational solidarity in China, because the theory does not take into account the Confucian concept of filial piety (Zavoretti, 2006). The challenges of modernisation and population ageing in China are framed in the context of a stronger traditional culture than is found in the Western world. Ikels (2006) noted that the meaning of filial piety is well illustrated by the Chinese character *xiao* (孝). In particular:

> *"This character is actually composed of two other characters: the top half of the character lao (old) and the character zi (son). When combined to constitute xiao, the element derived from lao rests on top of the character zi, that is, the 'elder' is on top of the 'son'."* (Ikels, 2006, p. 389)

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[4] *Sige xiandaihua* (四個現代化) in Chinese.
[5] At the Conference on Scientific and Technological Work held in Shanghai, January 1963.
[6] At the Third Plenum of the 11th Central Committee in December 1978.

Given that traditional Chinese characters and texts are read from top to bottom, the character of *xiao* reveals the ideograph that parents have higher status and are supported by children. Historically, filial piety has been a primary precept in Chinese culture that bound children to obey and serve their parents unconditionally. The education or examination system in China was designed to reinforce this. Its origins can be traced back to the Tang dynasty (618 - 907 A.D.), which established the Academy - or *Hanlin Yuan* in Chinese - that "first edited the Annals in order to gain precedents, and then controlled the emperor's correct deportment" (Weber, [1915] 1951, p. 117). After centuries of expansion, as a result of the promulgation of decrees, during the Ming dynasty (1368-1644) local schools where Confucianism was taught were set up in every village. Since then, within Confucian teaching, filial piety (*xiao* in Chinese), which is the core Confucian value within the family, has been the dominant concept regulating the relationship between children and their old parents.

In practice, the Chinese government has been promoting children's obligations to their parents since the early 1980s. At present, supporting old parents is a legal responsibility mandated by the Chinese Constitution[7], the Marriage Law of 1981[8], and Law of the People's Republic of China on Protection of the Rights and Interests of the Elderly[9]. China further promotes the Confucian ideology of filial piety by reframing the notion of *xiao* as a symbol of behavioural prescription and through its education system and mass media (Cheung & Kwan, 2009). Moreover, the government encourages people, especially those who live in rural areas, to sign a "family support agreement" stipulating the types and amount of support children are to provide for their dependent parents. In rural areas, such agreements are sometimes signed after a family meeting, with

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7 Approved at the National People's Congress of the People's Republic of China in 1982.
8 Approved at the National People's Congress of the People's Republic of China in 2001.
9 Approved at the National People's Congress of the People's Republic of China in 1996.

participants that include old parents, children, and the head of the village committee (Xu, 2001). Neighbourhood (village) committees, or other relevant institutions, will then monitor implementation of the agreement in order to ensure that old parents receive the entitled support.

On the other hand, rapid population ageing in China gives us a reason to question how likely the traditional family support mechanism will be able to meet the financial needs of tomorrow's older Chinese (Zeng & Wang, 2003). China became an ageing society at the end of the 20th century, when the 2000 census showed the number of people aged 65 or over was 88 million, forming 7.1% of the total population. Thirty years after its implementation, the one-child-policy has "successfully" slowed down population growth, and has contributed to a fertility rate that is below replacement levels. Such a decline in new births has created the "4-2-1" family structure in which couples, who are single children themselves, have four parents (their own parents and their parents-in-law) and their own offspring (Guo, 2007). A growing number of older people will be accompanied by a shortage of "kin supply" available to meet future needs in terms of financial support.

The rapidly growing number of older people has been a major cause of concern to successive Chinese governments since the late 1970s, when large numbers of cadres from government institutes, and employees of state-owned enterprises, began to retire annually[10] (Zhang & Guo, 2009). To provide formal, publicly funded old-age support since the 1990s, China has continuously made significant improvements to its pension system. However, the timing of the ageing transition in China is unique, because China will be the first major developing country to become an ageing country before it becomes a moderately developed country (England, 2005, ch.1). As a direct consequence, China

[10] The People's Republic of China was established in 1949. An individual would be aged 60 in 1979 if he/she was 30 years old in 1949.

will have fewer available resources and a lower income economy to handle the issue of an ageing population. In terms of pension reform, although China's urban-priority reform policy ensures a relatively high basic pension coverage rate for urban workers, it provides low pension coverage in rural areas (Wang, 2006).

Despite different degrees of adherence to traditional values of filial piety, it is not likely that young Chinese will maintain the same traditional family-based support for the rapidly increasing number of older people. Also, pension funds are very limited in terms of both range of coverage and level of benefit. Pensions already account for a large proportion of the government’s budget. As a developing country with a rapidly growing older population, it will be difficult for China to simultaneously sustain its rapid economic growth rate and still have enough money to ensure that the pension system is fully funded. As a result, China is now on its way to seeking a balance between formal and informal support with a view to managing the emerging issue of population ageing.

1.2 Aims and thesis structure

This thesis is constructed around the theme of intergenerational transfers in China. The main objective of this thesis is to investigate how the income of older people affects the intergenerational transfers from their adult children. The original idea of well-being has a broad context including the social, economic, psychological, spiritual or medical state of an individual or group. However, in this thesis, I limit the concept of well-being to the economic well-being of old parents. In China, where formal old-age support is underdeveloped, intergenerational transfers account for a significant proportion of parental incomes. Therefore, I keep the word “well-being” in the thesis title to remind and emphasise the importance of intergenerational transfers in terms of old-age support in China. Emphasis is also placed upon comparing and contrasting urban and rural differences, in order to observe how different settings of economic and societal development influence transfer behaviour. All analyses in this thesis are broadly divided into two parts: one for urban and one for rural respondents. Two research questions which form the key areas of interest in this thesis are as follows:

1) Will the trend of living arrangements weaken private transfers?
2) Will an increase in public transfers further crowd out private transfers?

These questions will be investigated empirically based upon two waves of nationally representative government survey datasets. The aim of this thesis is to extend knowledge of the nature of familial support, and specifically the extent to which younger generations exchange resources with old parents in countries experiencing recent demographic and socioeconomic changes. The data and methodology in this thesis have some advantages compared to previous empirical studies of intergenerational transfer from China. Firstly, the data used in this thesis covers approximately 20,000 individuals aged 60 and over, from 20 provinces, thereby making it nationally representative. Secondly, the survey asked and collected information from older respondents directly, which, in turn, allowed me to differentiate between intergenerational transfers and intra-generational transfers[11]. Thirdly, the nature of the two waves of datasets enables me to analyse the time trend between 2000 and 2006, and to use any exogenous shocks (e.g. changes in pension policies) during this period, to instrument potential endogenous variables. Finally, the use of non-linear methods adopted in this thesis to investigate transfer motives enabled me to take into account the co-existence of multiple transfer motives and to present a non-parametric relationship between public transfers and private transfers.

[11] The importance of differentiating between intergenerational transfers and intra-generational transfers will be highlighted in chapter 2.

To my knowledge, this is the first study to focus solely on intergenerational transfers in both urban and rural China which makes use of national representative data. Taking into account the rapid growth of the older population and pension reform policy in China, the benefits of having an appropriate public old-age policy would be substantial in both financial and efficacy terms. The Chinese government needs to confront the pressing issue of old-age support; not only to ensure a more balanced and sustainable economic development, but also to regain legitimacy among its ‘people’, thereby securing the country’s political stability and the current ideal of a harmonious society. A comprehensive and in-depth understanding of intergenerational transfers and their determinants is necessary in order to meet the challenge of improving older people’s economic well-being, as well as improving the effectiveness of China’s pension policy. In addition, the unbalanced nature of the development of China’s social security system between urban and rural areas, as well as its attempt to expand the social security system to cover older people in rural areas, provides an important context in which to study intergenerational transfer behaviours and the question of how to introduce a pension system in an economy in transition. Therefore, the policy implications are obvious: the Chinese experience of tackling the challenge of an ageing population will benefit not only China, but other developing countries confronted with ageing issues too.

In order to investigate the above-mentioned research questions, this thesis is structured as follows.

Chapter 2 summarises the conceptual and empirical literature relevant to the topic of intergenerational transfers, which includes defining and delineating the significance of theoretical and empirical work which addresses the motivations behind intergenerational transfer behaviour. Identification of the transfer motive is crucial, because it allows improvement in the effectiveness of social welfare programmes, and effective distribution of the cost of ageing between generations in society. This chapter also highlights the context and characteristics of older Chinese people, and their theoretical and empirical connections with intergenerational transfer motives. Early empirical studies from developed countries (the US and Europe) and developing countries (Peru, South Africa and the Philippines) have sought to empirically test transfer motives with a view to considering how characteristics of parents and children determine transfer behaviour. Cox, Hansen *et al.* (2004) argued that developing countries present a better setting to test transfer motives and the crowding-out effect. However, empirical work on Chinese's intergenerational transfer has only been undertaken recently. This chapter reviews recent empirical work from China in detail, with descriptions of the dataset and methodology used.

The following two chapters are scene-setting chapters to contextualise the thesis. Chapter 3 seeks to provide an understanding of the issues surrounding population ageing in China. This chapter analyses past, present and future demographic dynamics in China, and is based mainly on macro data from the United Nations. Mortality, fertility and age structure are discussed separately. Possible implications relevant to this study include changes in living arrangements and a decline in private transfers. The urgency of improving the pension system will be highlighted.

Chapter 4 reviews formal old-age support in China. The current Chinese pension system is the product of a long history of revisions and reforms, reflecting conflict between central government's announcements and implementation by local governments. It is one of the most complicated pension systems in the world, with very different pension arrangements co-existing across the country. In the context of rapid population ageing, a number of reform policies have been undertaken in recent years. Some have only partially been implemented, while others have simply served to further complicate the system. This chapter provides reviews of pension development in urban and rural areas. Analyses are drawn from numerous government documents and previous literature from both Chinese and foreign scholars. How well the current pension system is doing, what challenges it is facing and how well it will be doing in the foreseeable future will be discussed.

Chapter 5 introduces the methodology and data used in the following two empirical chapters. This thesis adopts a quantitative research methodological approach. Several statistical models including the logit model, the multinomial logit model, the ordinary least square regression (OLS), the two stage least squares regression (2SLS), the first difference regression, and the semi-parametric model will be explained. Also highlighted are the problems inherent in modelling transfer motives, and how the quantitative methods and datasets in this thesis can help to circumvent some of these difficulties. The datasets used in this thesis are the Sample Survey of the Aged Population in Urban/Rural China and the Follow-up Sample Survey of the Aged Population in Urban/Rural China. These datasets were collected by the China Research Centre on Ageing, and are the only two national representative surveys focusing on the population aged 60 and over. However, neither dataset is available for public use, and may not be familiar. Therefore, it is necessary to provide a detailed introduction of them. This chapter outlines the key characteristics of the datasets, including data collection and sampling methodology. Additionally, definitions and measures of key variables (e.g. children's transfers, pensions, education etc.) used in the subsequent chapters that deal with multivariate analysis are explained in detail. Both advantages and limitations of the methodology and datasets are highlighted and discussed.

Chapter 6 looks at living arrangements, which usually serve to indicate the quantity and quality of instrumental transfers that older Chinese parents receive. Recent studies

(Meng & Luo, 2008; Palmer & Deng, 2008; Zeng & Wang, 2003) have claimed that co-residence with children in China has declined over time. Analyses from Chapter 3 also imply that such a trend will persist for at least a few more decades. The question is whether or not changes in such living arrangements will undermine the capacity of intergenerational transfers. Literature from China does not give a clear clue. This empirical chapter seeks to extend our current understanding of living arrangement dynamics among older Chinese people. The trend in living arrangements between 2000 and 2006 is shown by descriptive statistics. In particular, not only actual living arrangements, but preferences regarding living arrangements, are analysed. This chapter examines the determinants: living with children or not, and how far a parent lives from adult children. The impacts of living distance from children on intergenerational transfers will be investigated, including the impacts on their occurrence and size.

The final core empirical chapter concentrates on testing the crowding-out hypothesis and identifying intergenerational financial transfer motivations. The theoretical predictions of altruism and exchange-based transfer motives are discussed in chapter 2. To empirically test transfer motives, however, is quite different, and is difficult. Not all of the previous studies were able to explicitly test the effect of social insurance programmes and old-age pensions on private transfers. Accurately estimating the transfer derivative[12] is the key to distinguishing altruism from exchange motives, and it has significant implications for how private transfers respond to public transfers. Chapter 7 aims to examine the determinants of intergenerational transfers and, more importantly, to estimate the transfer derivatives. It begins with presenting preliminary analyses of intergenerational transfers by showing cross-tabulating statistics and figures, with a focus on age patterns and urban-rural differences. The empirical analysis in this chapter is

[12] The transfer derivative indicates how much private transfers change as the income of the recipient increases. See chapter 2 for more details.

divided into two parts. Firstly, the incidence of receiving net transfers and its determinants were looked at; secondly, how these determinants influence the size of transfers conditioned on net transfers was considered. Limitations in the findings are discussed at the end of the chapter.

Overall, this thesis investigates the determinants of intergenerational transfers, with a specific emphasis on the impact of living arrangements and of public transfers, in the particular context of population ageing in China. Chapter 8 summarises and concludes this thesis with an overview of those findings that address the two research questions posed at the beginning of this section. It also considers the main implications of my findings for both policy and future research related to the study of intergenerational transfers.

Chapter 2: literature review

Generally, intergenerational transfer can be defined as money, services, or gifts other than money, that are exchanged between generations, and can be categorised into three types:

(a) Financial support that generations give to each other. Examples are the tuition fees that parents pay for children while they are students, and the financial support for the wedding when they get married. Or, as is normal in developing countries, the money children give to retired parents in order to allow them buy food, or the clothing that the children may buy for old parents. Bequests are also included in this category.

(b) Instrumental support which generations give each other. Examples include household assistance, such as helping old parents with cleaning, laundry, cooking and making home repairs, or personal care, such as bathing, dressing, eating, toileting and caring for parents when they are ill or disabled. It also includes the help that old parents may provide in assisting their children by babysitting the grandchildren and helping with home production. Hence, instrumental support refers to services that have economic value and can be purchased with money.

(c) Emotional support that adult children normally give to old parents. Examples include visiting parents, making phone calls to them, and giving them advice and attention. This form of intergenerational support is less clear in the sense that the cost element is ambiguous. Contact, for instance, is something that old parents enjoy, and from which they undoubtedly benefit; however, it is not *per se* a cost to the children. Emotional support is nonetheless important, since it is likely to have a significant influence on mental and physical health and well-being of older people.

In this thesis I restrict the concept of intergenerational transfers to exchanges between old parents and their adult children. Such transfers could take two forms: from parents to adult children (downward transfers) and from adult children to old parents (upward transfers). Moreover, financial and instrumental transfers are typically and appropriately examined separately; because different factors are associated with the provision of these transfers. The more specific focus of this thesis is on the degree to which adult children provide financial support to their old parents and *vice versa*. In practice, both downward and upward intergenerational financial transfers are present in both developed and developing countries, while the former tend to be more prevalent in developed countries, and the latter more pervasive in developing countries.

2.1 The significance of intergenerational transfer and its motives

Intergenerational transfers, whether in money or time, have long been recognised as having an important economic impact on society. The direction in which they flow - upwards to old parents or downwards to adult children - has been modified by the establishment of welfare state provisions. For example, older people who, prior to the establishment of social security systems, were financially supported by their offspring, have subsequently become providers of financial support to adult children (Kohli, 1999). Today, in most developed countries, where the social safety net provides sufficient resources to ameliorate poverty in old age, adult children can expect continuous financial support from their parents, who remain net donors after retirement, and even into very old age. Intergenerational transfers are important to both generations in other ways. On the one hand, financial transfers from old parents provide children with insurance against unexpected economic shocks such as unemployment. On the other hand, old parents may benefit if children provide care as a means of repayment of monetary gifts.

Hurd, Smith *et al.* (2011) used eight waves of a biennial national representative survey (1992 - 2006), the Health and Retirement Study (HRS), and found that the major direction of financial transfers between family members in the U.S. was from parents to children: in each wave, over a third of old parents gave money to their children. Among those who gave money to children, the average amount over two years was $14,000. Together with the findings relating to expected bequests from earlier research (Hurd & Smith, 2002), the authors estimated that old parents born in1923 and earlier give, in total, financial transfers to the value of around $90,000 on average to their children from the age of 75 until death, accounting for 30 per cent of the wealth of those aged over 75.

Albertini, Kohli *et al.* (2007), through an exploration of the 2004 *Survey of Health, Ageing and Retirement in Europe (SHARE)* that was conducted in 10 European countries, also found a general pattern of net downward flow of financial transfers from parents to their children in Europe. The authors found that on average 21 per cent of respondents had given monetary transfers to their children, while only 3 per cent of them had received money from children. In terms of transfer amounts, an average of €2,914 of financial transfers were given, compared to an average of €1,470 which was received. They suggested that although such a general downward transfer pattern was found to be prevalent in all the 10 European countries, across age groups, old parents in Nordic European countries, and the youngest group, were more likely to give - and indeed gave - a larger amount than old parents in Southern and Continental European countries and among older groups, respectively. They claimed that it was the welfare systems that enabled old parents to provide transfers.

Conversely, in developing countries, and in particular in most areas of Asia, upward financial transfers from adult children predominate and play an important role of support for older people. A study from South Korea (Kim, 2010), using the Korean Longitudinal Study of Aging (KLoSA) conducted in 2006, suggested that financial transfers from children to parents were more frequent, and usually much more significant, than the reverse. Kim found that nearly half of older people received money or in-kind transfers from children, with an average annual amount of 2 million *won* (US$1,700) net transfer receipt for people reaching retirement age. He claimed that such financial support, while insufficient, has nevertheless partially alleviated income shortages among the Korean older persons. Furthermore, studies from Indonesia (Frankenberg, Lillard *et al.*, 2002), Malaysia (Lillard & Willis, 1997), Taiwan (Lin, Goldman *et al.*, 2006) and Hong Kong (Chou, 2008), found a similar upward transfer pattern and evidence that children's financial transfers to old parents were important means of protecting them against shortfalls in retirement income.

With respect to the significance and popularity of intergenerational transfers from children to old parents, China – and particularly rural China - represents a more extreme example. This can be attributed to both low pension coverage and benefit levels[13], and the social norms that regulate the behaviour of children in respect of the requirement to support old parents. A study (Lee & Xiao, 1998), which used data from a survey conducted in 1992, found 40.8 per cent and 70 per cent of older people received positive net monetary transfers from children, which accounted for around a third and a half, respectively, of average parental incomes in urban and rural China. Later studies (Cai, Giles *et al.*, 2006) also found evidence that the transfer flow is upward from children to parents and that private transfers tended to correspond to low household income of retirees, when income fell below the poverty line.

Intergenerational transfers are vital because in all types of economies they help to smooth out consumption over the economic life cycle and, in particular, to finance income deficits during the long "dependent" periods of childhood and old age. People at

[13] For more details please see chapter 5.

different ages and periods of their economic life cycle comprise a country's total population. Those in the population that are generating lifecycle surpluses (working age) would have more than they require, while others incurring deficits (children and older persons) would not be able adequately to support themselves. Consequently, resources have to be transferred or reallocated from the surplus age groups to the deficit age groups. There are various ways to achieve across-age transfers or intergenerational reallocations of resources, and the family represents a critical social institution in terms of such reallocation of resources. Previous research (Frankenberg, Lillard *et al.*, 2002; Willis, 1982) has pointed out that, inter- and intra-household intergenerational transfers (both in money and time) help determine the consumption patterns of family members across the life cycle, and play a crucial role in economic development.

Empirical analyses that consider how the characteristics of parents and children determine transfer behaviours, and particularly how private transfers respond to recipients' incomes, are of interest in academic and policy circles. This is because whether families undo or reinforce changes in public transfers by adjusting private transfers plays a central role in influencing the effectiveness of redistributive policies, such as social security and welfare programmes, for older people. There are at least two reasons why policymakers and scholars should be aware of the size and determinants of private transfers. The first reason is that public programmes such as pensions, support for single mothers, and unemployment insurance, could be neutralised[14] by the response in terms of private transfers if private donors reduce their transfers in response to increases in public transfers. Private transfers are "crowded out" by public transfer, and in this case the positive impact of an increase in public programme benefits gives rise to a reduction in family support. Rather than benefiting older persons, a public programme might reduce

[14] Or, in a one-to-one crowding out case, it introduces costs because government transfer programmes usually have administrative costs.

the burden on working children who had previously contributed to supporting their old parents. The "crowding out" effect has been found mostly in developing economies (Juarez 2009), or among small groups of older people with low incomes in developed countries, where upward intergenerational transfers were still prevalent (Reil-Held, 2006).

The determinants of intergenerational transfer are also important because recipients might share some of the benefits of public programmes with family members. In other words, adult children may benefit from public programmes which are supposed to benefit only the recipients of the public transfers. Indeed, when public transfers increase, parents may increase private transfers to their offspring by the exact amount of the public transfer, in order to maintain consumption of both parties at the previous level. In this case, public transfers actually "crowded in" private transfers, resulting in an inefficient backflow of pay-as-you-go financed public policy for the younger generation. The "crowding in" effect is more common in developed countries, under welfare regimes where downward intergenerational transfers are prevalent (Albertini, Kohli *et al.*, 2007).

How private transfers respond to public transfers is relevant in both developed and developing countries. Either the "crowd out" or "crowd in" effects imply that any change in public transfers would be offset by a corresponding change in private transfers, leaving the distribution of economic well-being unaltered. Because government reallocation programmes involve administrative costs, they would create nothing but deadweight losses. Even in a less extreme scenario, the "crowd out" or "crowd in" effects are not completely pervasive, and ignoring them introduces an upward bias into the calculation of the effect of government transfers on resource redistribution.

In China, concerns about responses to private transfers are particularly germane. Children's transfers are particularly important in providing basic economic protection to a significant proportion of the older population living in poverty, thereby providing a private "safety net" proving particularly critical in rural China, where adult children - especially sons - are considered the primary source of support in old age, and state funded social security remains limited. Equally, pension reform has been carried out in such a way as to have served to increase both the coverage rate and benefit levels. Today, only half of Chinese older people receive pension benefits, while the government aims to build up a social security system that covers the entire population. Coverage under the pension scheme for urban residents has been extended beyond employees in government institutions and state-owned enterprises, and now embraces employees in collective enterprises, private enterprises and, latterly, all urban residents. Meanwhile, in 2009, the new rural social insurance scheme was implemented in several counties, with coverage due to increase in coming decades. Although the current benefits are small, it is the first time that the Chinese government has directly contributed to the support of older people in rural China.

Accurate estimates of the occurrence, size and derivative[15] of intergenerational upward transfers in China would not only help policymakers better understand the full extent to which older people in China depend on their adult children, but would also assist in improving the effectiveness of current pensions policy. Moreover, most of today's developing countries (e.g., most Latin American countries and Asian countries) are facing, or will in future face, challenges of demographic ageing with limited economic resources and an underdeveloped social safety net. An understanding of how private transfers respond to public transfers would also benefit other developing countries. Therefore, the critical question to be addressed here is: if social insurance programmes or public assistance were to be provided, might those upward private transfers from children

[15] The term of transfer derivative will be introduced later.

decrease or entirely disappear?

2.2 Theories of intergenerational transfers

To answer the question of why adult children provide support to their old parents, several theories have been developed with a view to addressing the motivations behind intergenerational transfer behaviour within families. My theoretical conceptualisation integrated different disciplinary traditions in the study of intergenerational transfers. Complementary perspectives from sociology and economics are employed to generate hypotheses that predict the empirical correlation between characteristics of parents and children and the pattern of transfers between them. Two main competing hypotheses have tended to produce the most interest among social scientists: the altruistic motive and the exchange motive. Although these two theories are sometimes presented as mutually exclusive, it is possible for a private transfer to be motivated by both (Secondi, 1997). For instance, an ageing father might decide to give money to his adult child because helping his child makes him happy (altruism), and at the same time in the hope and anticipation that his child will express his gratitude by visiting him more regularly (exchange). The two main competing theoretical frameworks in this field, altruism and exchange, as well as other alternative theories explaining intergenerational transfer behaviour, will be reviewed in detail in this section.

Intergenerational solidarity

Theoretical perspectives that focus on broader systems of norms and rules for transfer behaviour deserve revisiting. The theory of intergenerational solidarity has been developed by Bengtson and his colleagues to account for patterns of parent-child relationship after children reach adulthood and have careers and families of their own (Bengtson, Olander *et al.*, 1976). Intergenerational solidarity is conceptualised as a multidimensional construct that explains the mutual nature of supportive relations between parent and child originally reflected in three distinct elements of parent-child interaction: normative, functional and structural solidarity (Atkinson, Kivett *et al.*, 1986; Roberts & Bengtson, 1990). Bengtson and Roberts (1991) expanded the idea of intergenerational solidarity to include another three components – associational, affectional, and consensual solidarity. Among its six dimensions, the most relevant for the study of intergenerational financial transfers is the functional solidarity that reflects the extent of resource sharing and (mutual) support between parent and child. Functional solidarity accounts for both objective and subjective aspects of intergenerational resource transfers. While the objective aspect indicates the type (e.g. money and love), quantity and quality of resource to be given or received, the subjective aspect indicates the assessment of the relative balance of resources made by parents and children. If the theory of intergenerational solidarity applies to parent-child relationships in China, one must find resource exchange and mutual support provision between parent and child. Moreover, if normative solidarity refers to the Confucian concept of filial piety (or parents' evaluation of a child's filial piety), the theory of intergenerational solidarity predicts that parents' evaluation of their child's filial piety is positively associated with children's financial support to parents.

The principle of reciprocity

Another essential theoretical perspective that tends to explain intergenerational transfer behaviour, namely the 'reciprocity principle', was introduced to sociological theory by Gouldner (1960). Generally speaking, reciprocity means a gift or favour motivated by another gift or favour (gifts and return-gifts) between agents (or generations). Such gift-return-gift exchange is governed by a norm of reciprocity - the expectation that a debt should be repaid. Under the rule of reciprocity, when the donor benefits another, an obligation is generated and maintained until it is paid by the recipient. Failure to comply with the rules may place one in an intolerable position, especially in a family context: "opting out" may not always be an acceptable option, and group survival is often a crucial issue. Therefore, essential to reciprocity is the understanding of the gift-return-gift relation as a mechanism by which solidarity is a central basis for interaction in families or social groups and is maintained. Furthermore, sociologists argue that the norm of reciprocity, the principle of obligation to repay, is universal but functions differently in some degree in different cultures (Gouldner, 1960). The concept of reciprocity has since become very influential, guiding numerous empirical studies on intergenerational transfers of money, time and labour (e.g. Cong & Silverstein, 2008; Künemund & Rein, 1999; Silverstein, Conroy *et al.*, 2002).

Reciprocity is distinct from a self-interested exchange in the way that each transfer proceeds from a set of internal obligations—to give, to receive, and to give back—rather than by external obligations that are conditional on the other being provided (in which case such transfer is not a "gift") (Kolm, 2006). In other words, reciprocity indicates that transfers result from an act that is free in isolation (because each transfer is a gift), while transfers of a self-interested exchange are mutual conditional (a transfer has to be performed if the other is performed). The nature of reciprocity may either be direct (A gives to B entails B gives to A) or indirect (A gives to B entails other consequences). Direct reciprocity still bears some similarities with standard *quid-pro-quo* exchange between two agents (or generations). A simple example is adult children repay parents' investments in education by supporting them in old age. Indirect reciprocity involves more than two agents (or generations) and implies that either that the recipient gives back to a third party (rather than the donor) or that the donor will be repaid by a third party (rather than the recipient) (Arrondel & Masson, 2006). For example, the way to pay back the education I received from my parents is for me to give proper education to my own children, and so on; of course, this process will often work through imitation or transmission of norms. Indirect reciprocal exchange that is governed by normative obligations, therefore, is similar to the altruistic hypothesis in the way that transfers are a result of own self-interest. The difference is that in the case of indirect reciprocity, transfers are not solely governed by recipient's need, but also by the relationships within the social group. In many cultures, for instance, more distant relatives would not assume financial support of an indigent family member if a child were available, but might fill in if no more 'appropriate' kin could provide support.

In China, where Confucianism originates, the Confucian concept of filial piety has been the dominating moral principle that binds the parent-child relationship. Although social conditions are changing and have come to redefine children's filial obligations to their parents, filial piety and its core value – supporting parents in old age - have been an important socialisation goal in Chinese societies (Liu, 2000). Under the Confucian teaching, a child who is considered to have successfully met the cultural expectations of filial piety, is revered and described as filial or *xiao* in Chinese. In contrast, a child who does not meet the cultural expectations of filial piety to his/her parents is considered to be gravely lacking in virtue and may be condemned by family and community. The Confucian concept of filial piety has contributed to constitute a strong ideological basis for the social norm of reciprocity in Chinese culture.

Exchange hypothesis

The exchange hypothesis provides an alternative explanation of transfer behaviour, which relies on the assumption that giving support is a cost for the donor, and receiving a transfer represents a benefit to the recipient. Given this, the theory argues that intergenerational relations can be seen as a *quid-pro-quo* exchange of money for time. Cox's (1987) model posits that a donor's private income transfers are payments for services provided by the recipient. Transfers could be part of one-off exchanges, or could form part of a long-term contractual relationship. Monetary transfers given today might be repaid, in cash or in kind, in future years. Service, in the exchange motive model, can be any type of in-kind help provided by household members, such as shopping, home repairs and gardening provided by adult children, and running of errands and childcare provided by old parents. For instance, the increasing number of mothers with young children participating in the labour force has had the important consequence that more adult children rely on services provided by their old parents; like caring for grandchildren and doing housework. In return, the grandparents may be given money by their children. (Morgan & Hirosima, 1983).

Let d denotes the donor and r denotes the recipient. Under the exchange hypothesis, assuming that *d* views the services as normal goods[16], old parents are the only providers of services, and money transfers are payments for services from *r*, an increase in *d*'s income will increase both the likelihood and the amount of money transfers *r* receives, just as it does in the altruistic model. This is because *d* is now willing to pay a higher price for the same services. By contrast, an increase in *r*'s income lowers the likelihood of the money transfer. This is because, as income increases, the opportunity cost of providing the services increases, which finally serves to raise the price of the services. For example, wealthier parents are able to pay for their holiday trips, and are willing to do so rather than babysitting grandchildren, while poor parents may have to babysit grandchildren in order to make children pay for their holiday trip. Alternatively, we can understand how if a worker becomes wealthier, he or she will have a higher expectation in terms of remuneration. Because he or she is the only worker in the labour market (remember, the theory assumes parents are the only providers of services), his or her wage will eventually increase. Given that *d*'s income remains unchanged, *d* will consume fewer services (the nature of normal goods) and so money transfers are less likely to occur. If *r*'s income increases and a money transfer does occur, however, the amount of the financial transfers could either increase or decrease depending on the elasticity of *d*'s demand for the services.

Elasticity is a common and useful economics concept. If the price of a good increases, demand for that good on the part of consumers normally declines. They may either consume less of that good, or replace it with another good. Conversely, if the price of a good falls, consumers will normally increase demand for that good, thereby consuming more and reducing their consumption of substitutes. Nevertheless, there may

[16] 'Normal goods' is an economics term referring to any goods for which demand increases when income increases and falls when income decreases but price remains constant (e.g., holidays, cars and hi-tech products). A counterpart of normal goods is inferior goods, demand for which decreases when income increases (e.g., cheap cars and potatoes).

be some goods for which demand does not change, or for which the change in demand is of a small magnitude in response to price changes. Gas, milk and prescription drugs are examples of such goods. By definition, the more the demand falls as the price rises, or the more the demand increases as the price drops, the greater the price elasticity of such demand for a particular good. Consumer demand for a good is considered elastic if a one per cent increase in the price of a good results in more than a one per cent decline in demand of that good (i.e. elasticity is great than 1). However, the consumer's demand for a good is considered as inelastic if a one per cent increase in the price of a good results in less than one per cent decline in demand of that good (i.e. elasticity is between 0 and 1). In the current study, if old parents are the only resource on which adult children can rely, demand for services provided by these parents is more likely to be inelastic, because there is no substitute for them.

With respect to the exchange motive, an increase in *r*'s income will lead to following consequences. If *d*'s demand for services is inelastic, *d* will transfer a larger amount to *r*, because of the higher price charged for the services. In this case we will observe a positive association between the transfer amount and *r*'s income. Thus, under the exchange motive, the effect of public transfers may be strengthened. For this reason, this effect is also called the "crowd in" effect in the empirical literature (Kunemund & Rein, 1999). Conversely, if *d*'s demand for the services is elastic, *d* will use a cheaper alternative by way of a substitute for the services *r* provides, and will reduce the transfer amount to *r*. In this case, a negative association between the transfer amount and *r*'s income will be observed, which is called a "crowd out" effect.

The exchange hypothesis predicts a specific relation between the amount of services provided to the donor and the size of transfers received or still expected. Critics have pointed that such predictions of the exchange hypothesis are ambiguous and perhaps too flexible (Arrondel & Masson, 2006). The assumptions that the market offers only poor substitutes for the recipient's service, and that the implicit price of a recipient's services increases with his/her earnings, are too restrictive. Moreover, the effect on transfers of an increase in public transfer is not clear, depending notably on the degree of substitutability or complementarity between donor's consumption and recipient's services.

The altruistic hypothesis

The altruistic hypothesis could be regarded as the opposite hypothesis to exchange. The theory places the emphasis upon the importance to individuals of moral obligation to help, serve, or benefit others at a cost, where necessary, in terms of their own self-interest. Becker (1974) was one of the first to develop the theory of altruism within a household as a motive for monetary transfer behaviour between parents and children. Altruism occurs when it is assumed that family members are concerned with the economic and material wellbeing of others, in which case the utility[17] of household member *d* (the donor) positively depends on the well-being of another household member *r* (the recipient). Such concern motivates the household head to redistribute resources Pareto efficiently[18] among family members, so that no one can be better off without making someone worse off. The head may decide to reallocate resources to needier family members out of a sense of altruism.

As a result, altruism may lead adult children to transfer resources to their old parents,

[17] In economics, utility is a measure of relative happiness or satisfaction (gratification) gained. Given this measure, one may speak meaningfully of increasing or decreasing utility and thereby explain economic behaviour in terms of attempts to increase one's utility.
[18] Pareto efficiency is an economics term describing a situation when no alternative of allocation could be made to improve the welfare of any given member without reducing the welfare of some other member.

particularly in a society where traditional values and the obligation to repay parental investment prevail (Lee, Parish *et al.*, 1994). Alternatively, old parents may offer financial assistance to their offspring simply because they care about them, and receive vicarious satisfaction from the offering. According to the altruism hypothesis, the probability and magnitude of transfers are both positively correlated to the income gap between *d* and *r*. The basic prediction of the altruism hypothesis is that if the income of *d* increases, the probability of *d* transferring money to *r* will increase. Moreover, given that a transfer occurs, an increase in *d*'s income raises the amount of the transfer *r* receives. Conversely, if the income of *r* increases, the probability of *d* transferring money to *r* will decrease, and if a transfer does occur, the amount of the transfer will decrease as *r'*s income increases.

In the context of upward transfers, the more altruistic the children are, the more likely are parents to receive transfers, and, given children's transfer occurs, the more financial supports will be transferred to parents. However, children's concerns about their parents' material welfare are necessarily modulated by their concerns about their own financial wellbeing. Indeed, differences in the income level of adult children are, to a significant extent, responsible for variations in the pattern of monetary transfers. Wealthy adult children have greater resources to redistribute, and are thus better able to support their parents. We would therefore expect that children with lower incomes, or those who are unemployed, would be less likely to provide monetary support to their parents. On the other hand, old parents experiencing relative economic hardship, or who are suffering from poor conditions of health, should therefore be more likely to receive monetary support from their adult children, and receive a larger amount of transfers, if the transfer takes place, than those who are less in need of financial support.

Altruism implies doing something for others because one is concerned with the welfare of others, and it would appear particularly relevant to Asian countries, and especially China, the place of origin of Confucianism. Confucius made benevolent love the core of his ethical teaching, emphasising the obligation to display altruism and humanity towards other individuals within a community. Filial piety (*xiao*) is considered to be among the greatest of virtues, and is promoted by Confucianism. The imperative implicit in "filial" (meaning "of a child") requires that a child, originally a son, should show respect to his parents. Therefore, the concept of altruism has a long history in China, along with filial piety. The slight difference between the two concepts is that filial piety emphasises the blood connection between parents and children, whereas altruism focuses on the relationship between people who may not share the same blood.

An important effect of altruism, in terms of intergenerational transfers in China, is the "crowd out" effect on public transfers which was discussed in section 2.1. If intergenerational transfers are completely founded upon altruism, an increase in public transfers, including a rising rate and level of pension coverage, may have no net effect on the income of the intended beneficiaries. Even with a lesser degree of crowding-out, an analysis of the public transfer income that the dependent older persons receive which ignores such an effect would result in an overstatement of the distributional impacts of the programme.

As discussed above, a distinctive prediction of (pure) altruism is that both the probability and the amount of transfers should be negatively correlated with the level of recipient's income, with moreover strong compensatory effects. However, the altruism hypothesis cannot explain non-compensatory gifts. For example, Cox and Rank (1992b) found that in the US, transfers from parents to children increase as children's income increases, indicating non-compensatory transfer behaviour. Another limitation of the altruism hypothesis is that it is difficult to examine this theory empirically. The key distinction between altruism and other transfer motives is that in an altruistic system, needy family members would theoretically receive more transfers than they provide over their lifetime. One ideally needs comprehensive panel data to observe private transfers over the life course. Unfortunately, the absence of adequate date makes this prediction difficult to test (Lillard & Willis, 1997).

The term transfer derivative, which shows by how much private transfers change as the income of the recipient increases, is usually used to evaluate the transfer motive. According to the above discussions, a negative transfer derivative is consistent with both altruism and exchange hypotheses, whereas a positive association is consistent with the exchange hypothesis only.

Alternative hypotheses

The hypothesis of expectation of future reciprocity (Becker & Tomes, 1976; Cox, 1987; Künemund, 2008), also known as the long-term exchange motive, assumes households maximize their well-being through long-term arrangements between generations. When an economy is in transition, its labour market will place a higher premium on skilled labour, while at the same time individuals have difficulties in borrowing against their future incomes due to the existence of borrowing constraints. Therefore, a rational strategy for families who wish to maximize their wealth is for parents to provide assistance for their children's education through both grants and loans when the children are young. In return, children may repay parents by sharing with them the returns on their education in the form of support in old age. According to the reciprocity hypothesis, one should expect a positive relationship between the children's education level and the magnitude of monetary transfers to their parents.

The self-interest hypothesis (Bernheim, Shleifer *et al.*, 1985) assumes that individuals are only interested in maximising their own personal utility, and give money or in-kind transfers in return for future rewards. For example, if parents are wealthy and have property to bequeath, then adult children may give them more gifts in order to buy parents' "favour". Under the self-interest model, the amount of transfers is positively associated with recipients' wealth. Few studies in other Asian countries and the United States, however, have found self-interest to be the motive for adult children's financial transfers to their old parents (Lee, Parish *et al.*, 1994; Lillard & Willis, 1997; McGarry & Schoeni, 1995). For one thing, old parents' wealth in Asian countries is generally limited. Even when adult children are motivated by self-interest, their provisions for wealthier parents are more likely to be in the form of companionship, rather than monetary goods.

The demonstration effect theory (Cox & Stark, 1996; Cox & Stark, 2005) involves three generations. It assumes adult children help their parents in order to show their children how they expect them to behave towards them when their children become adults. In addition, parents may support children when they are young, so that children will then feel closer to them, and will want to take care of them, when they reach old age. This model involves the presence of a third person, and is rooted in indirect reciprocity, rather than being a direct exchange between donor and recipient. As a result, old parents are expected to receive more support from their adult children when adult children have offspring. Also, old parents should expect more support from adult children when their grandchildren are co-residing, or nearby (as early experiences strongly shape behaviour during adulthood).

Aside from the models mentioned above, several other theories have been proposed to explain intergenerational transfers: the household bargaining power theory (Manser & Brown, 1980; McElroy & Horney, 1981), which hypothesises the household is a group of agents making joint decisions through cooperative bargaining between donor and recipient; the risk and insurance theory (Bernheim, Shleifer *et al.*, 1985), which assumes that individuals rely on transfers from their children for old age security (Willis, 1980); and the gender difference theory (Lee, Parish *et al.*, 1994; Sun, 2002). The altruism and exchange theories, however, are fundamental to most other theories, and form the basic framework in this field.

Social scientists are interested in empirically estimating the transfer derivative, and tend to focus on distinguishing between crowding-out and crowding-in hypotheses. The estimation of transfer derivative empirical distinction between crowding-out and crowding-in hypotheses is important for the evaluation of a public transfer programme and maintenance of recipients' economic well-being. As has been discussed, if private transfers are motivated by altruism, public transfers may crowd out private transfers; if private transfers are motivated by exchange, public transfers may crowd out or crowd in private transfers, depending on the demand elasticity. This difference allows social scientists to find hints of the transfer motives empirically. However, findings from earlier studies have not reached a consensus, and mixed findings regarding each of these models are reported in the literature (Lillard & Willis, 1997; Zimmer & Kwong, 2003).

2.3 Literature review of intergenerational transfer derivatives

2.3.1 Previous work in developed and developing countries

Most of the early empirical works on intergenerational transfer derivatives are from the United States. A number of research projects using US household data have demonstrated that intergenerational transfers flow from old parents to adult children, and found statistically significant results that the transfer amount was positively associated with a higher recipient's income, indicating an exchange motive (Cox, 1987; Cox & Rank, 1992a). More recently, results from analyses of the Health and Retirement Survey 1994 and 1996 showed that children with higher expectations in terms of monetary transfers from parents provided more instrumental support, but their expectation of receiving bequests did not have a significant impact on time transfers (Wang, 2010). The author claimed that intergenerational transfer was motivated by short-term exchange, rather than long-term exchange.

Conversely, studies have found evidence to support the altruism hypothesis in the US. For example, using the Health and Retirement Survey, McGarry and Schoeni (1995) found a strong negative and significant relationship between transfer amounts and the recipient's income. This is the only study which found evidence of a pure altruistic motive[19]. Although some other empirical work also found crowd out effect of intergenerational transfers, the estimated negative effect was small in magnitude, suggesting that crowding out from public transfers is negligible. For instance, Cox and Jakubson (1995), by using representative cross-sectional data of an anti-poverty programme in the US, estimated that a one dollar increase in public welfare expenditure would result in no more than a 12 cent fall in private transfers. Altonji, Hayashi *et al.* (1997) found that although children on lower incomes received more transfers, transfers from parents increase by less than 13 cents for every one-dollar reduction in such children’s income. These results do not, therefore, point to a purely altruistic motive, because the relationship between the two variables was not one to one, while a purely

[19] A pure altruistic motive implies a one dollar increase in recipient’s income would result in a one dollar fall in donor’s money transfers.

altruistic motive should produce a one to one relationship.

In the European context, it has been demonstrated that children's needs and parental resources are the factors most likely to influence intergenerational transfers. Attias-Donfut and Wolff (2000), for example, found that in France adult children who received public transfers, which were considered signals of need, were significantly more likely to receive monetary transfers from old parents. Reil-Held (2006) used data from Germany, and found both the “crowd out” and “crowd in” effect. On the one hand, for parents making downward transfers, money transfers given to children were positively associated with the amount of public transfers parents received. On the other hand, for the much smaller group of old parents who received monetary transfers from children, they found a negative correlation between private transfers children gave and the public transfers parents received. However, the transfer derivatives were found to be small in terms of magnitude.

Studies based on the Survey of Health and Retirement in Europe (SHARE) focus more on the transfer supply side, i.e. parental resource, in order to examine the impact of differences in state expenditure on various welfare regimes for intergenerational money transfer. Albertini, Kohli *et al.* (2007) clustered 10 European countries into 3 welfare regimes: Southern European; Continental European; and Nordic European. They included the welfare regime variables in logistic and OLS regressions as dummy variables (with Nordic as the reference group). Albertini and his colleagues found statistically significant estimates of the welfare regime dummy variables, and claimed intergenerational transfers were influenced by the welfare regime effect: transfers from parents to children are more frequent, but less intense, in the Nordic European countries than in the Southern ones, with the Continental European countries lying somewhere between the two. Schenk, Pearl *et al.* (2010), however, argued that parental resources and children's needs were most likely to influence intergenerational money transfers, while the probability of giving from old parents did not differ across welfare regimes. Schenk and his colleagues applied the multilevel models with random effects at the parental level, and found that adult children who did not find a job, or who had their own children, were more likely to receive parental transfers, whilst parents who had alternative expenditures and families where at least one of the parents was in poor health were less likely to give money.

The literature from developed countries therefore suggests transfer derivatives are small (except McGarry & Schoeni, 1995), making crowding-out insignificant or unlikely. Cox, Hansen *et al.* (2004) have pointed out that the failure to find economically significant transfer derivatives may be as a result of social scientists using the wrong methods or looking in the wrong places. In developed countries, where both the young and the older population have been protected by large public transfers for a century, most private transfers have probably been crowded out, reducing the sensitivity of the transfer derivative. By contrast, private transfers are widespread and still important economic resources for recipients (old parents) in developing countries, while public transfers in most developing countries are insufficient or negligible. Accordingly, perhaps the transfer derivative, especially in terms of the crowding out effect, seems more significant in developing countries.

For example, Cox and Jeminez (1992) analysed the transfer derivative in Peru, and discovered that old parents who did not obtain social security income received 20 per cent fewer transfers from their children. Research in South Africa (Jensen, 2003) found a significant degree of negative transfer derivative, i.e. crowding out effect of public transfers. The author estimated that each *rand* increase in public pension income for old parents was met with a 0.25-0.30 *rand* reduction in remittance transfers from children.

Cox, Hansen *et al.* (2004) used threshold regression, allowing the transfer derivative to switch if recipients' pre-transfer incomes were above the threshold, to investigate the responsiveness of private transfers in the Philippines. Their non-linear model suggested that while each one *peso* increase in parental incomes led to 0.4 *peso* decline in children's transfers for the poorest households, such a crowing-out effect was negligible for richer households. Juarez (2009) used the Mexican Household Income and Expenditure Survey (ENIGH) for the period 1996–2004, covering periods before and after the "Nutrition Transfer for Senior Adults" programme change, to test the transfer motive in Mexico. Juarez claimed that her method was superior, because she estimated the effect of an exogenous increase in the income of older persons, which controlled for the endogeneity of pre-transfer income and provided more reliable results. She claimed that she found an almost complete crowding out effect for older persons, with 700 *pesos* of income which accounted for 94 per cent and 86 per cent respectively of her female and male samples. She found that for women, each one *peso* increase in pre-transfer income led to 1.02 *pesos* reduction in children's domestic transfers, of which 77 cents resulted from the reduction in the probability of receiving transfers, and 25 cents resulted from the decrease in the amount received when transfers are positive. For men, she found that each one *peso* increase in pre-transfer income led to 1.66 *pesos* reduction in children's domestic transfers, of which 1.05 *pesos* resulted from the reduction in the probability of receiving transfers, and 61 cents were as a result of the decrease in the amount received when transfers are positive.

2.3.2 Previous work in China

Chinese families are experiencing transition from extended to nuclear families as a result of demographic trends (see chapter 3). The shrinking number of children and household size has posed challenges to the sustainability of reliance on private intergenerational transfers. However, literature reviews assessing the changes in arrangements for old age support or investigating the relationship between living arrangements and private transfers in China are rare. To avoid confusion, such literature on living arrangements will be provided separately in chapter 6. This section reviews literature addressing the link between children's transfers and parental incomes.

While the potential linkage between public and private transfers has obvious significance for policy, empirical work on Chinese's intergenerational transfer derivative is rare; either as a result of the scarcity of adequate household data, or due to lack of concern for older people. For example, for some early research in urban China (e.g. Chow, 2000; Shang, 1999; White, 1998), although descriptive discussions were provided, no analyses of the significance of private transfers for old-age support were presented. Only in recent years, with China's rapid ageing process, economic development, and concern about long-term growth, has the subject of intergenerational transfers been receiving increasing attention from scholars. More importantly, the availability of data sets containing both private transfer and social security information has enabled research on this topic.

Secondi (1997) used data from a rural Chinese household survey referring to the year of 1988, and drawn from 28 of China's 30 provinces, to test the hypotheses of altruism and exchange, and to study the size and direction of monetary transfers in rural China. The data demonstrates that private transfer in rural China appeared to be upstream: from children to old parents. His main finding is that the transfer amount is positively associated with recipient's income, which, as he explains, is consistent with the exchange hypothesis that children's transfers may be payments in exchange for services provided by old parents. He argues that altruism alone cannot explain private transfer behaviours, and that exchange may be involved in some transfers, and suggests that care of grandchildren is likely to be one of the main services that rural parents render to adult children in exchange for money. Finally, the author claims that increases in public transfer should not crowd out private transfer, but might actually increase the amounts transferred privately. However, this conclusion should be considered cautiously. The key variable in this study, income remitted or brought by non-co-resident family members, theoretically includes the remittances made by young males migrating to cities to their spouses, children, and old parents in rural areas. Therefore, Secondi's study was unable to differentiate between intergenerational transfers and intra-generational transfers. It is quite likely that the intra-generational transfer motive is different from the intergenerational transfer motive, and if that is the case then the results in Secondi's study are biased.

Lee and Xiao (1998) use nationally representative data, namely the 1992 China Survey on Support Systems for the Elderly, to examine the determinants of adult children’s financial support for old parents. They find a higher proportion of the rural old parents receiving financial support than the urban older persons. However, among those that received children’s transfer, the average amount that older adults received is lower in rural areas than in urban areas. Their logistic, and OLS models, suggest that parents’ need was a major factor in determining children’s financial transfer behaviour in both urban and rural areas; old parents that had lower incomes, lower occupational positions, or poorer health were more likely to receive support, and received larger amounts, than those old parents who had higher incomes, higher occupational positions, and better health. Evidence of short-term exchange motives was found: adult children gave money in exchange for goods and services, including housing and child care from parents. The main finding of this study relates to intergenerational long-term exchange: older retirees from the public sector using the *dingti* option, which involves parents retiring early so that one of their children may take his or her job, are found to be more likely than other retirees to be in receipt of financial support, and received larger amounts, from their adult children. Lee and Xiao conclude by suggesting a co-existence of need-based and exchange transfer motivations.

Liu and Reilly (2004) investigated the determinants of private transfers of urban-based rural migrants (i.e., remittances) to their rural households using a 1995 survey on male migrant workers in Jinan, Shandong Province. They found that the recipient's income did not have statistically significant effects on either the probability of receiving remittances or crowded out the value of remittances received. Migrant children's education was found to have little influence on the incidence of remittance or on the amount of remittance. They maintained that the results appear to reject altruistic transfer motivation, and at the same time suggest that the evidence for an exchange transfer motivation was weak. However, we need to bear in mind that this study may suffer from data limitations and bias. Firstly, as the authors noticed, the survey covers solely male migrants, who then provide all information including recipient's income. This may generate measurement bias, because many migrants had moved out of the parental household quite a long time prior to this. Secondly, as in Secondi's work, remittances may not only represent intergenerational transfers to old parents, but also intra-generational transfers to spouses and children in rural households. Although Liu and Reilly noticed such bias, and did further analysis of non-married migrants in order to partially exclude intra-generational transfer, no significant correlation between remittances and recipients' income (transfer derivative) was found.

Cai, Giles *et al.* (2006) used the China Urban Labor Survey (CULS), conducted in five cities[20] in 2001 and 2002, to exam the correlation between private transfers to retired workers and the workers' pre-transfer income. Instead of assuming a linear relationship as previous research had done, the authors applied two methods, thereby allowing a non-linear correlation between transfer amount and pre-transfer income. They first adopted a conditional least square (CLS) threshold model from Cox, Hansen *et al.* (2004) that allows for the relationship change if the recipient's pre-transfer income is above a certain level (the threshold). They found that for each one *Yuan* reduction in pre-transfer income, transfers increase by 0.52 to 0.68 *Yuan* if the recipient's income is below the threshold, while the estimate fell closing to zero above the threshold. The second method is a semi-parametric partial linear model, proposed by Yatchew (1998; 2003) that allows the relationship between transfer amount and pre-transfer income to change smoothly along the receipt's income level. Their non-parametric model showed that, for income levels below half the average urban poverty line, a one *Yuan* decline in pre-transfer income leads to 0.20 to 0.26 *Yuan* increase in transfers. The estimate fell 0.1 to 0.6 *Yuan* for recipient's income around the urban poverty line, and even fell to zero when the recipient's income level was twice the level at the poverty line. The authors concluded that whilst private transfers are responsive to recipient's income levels, which are consistent with altruistic transfer motive, this happened only when the recipient's income is at a very low level. They also claimed that an increase in public transfers will not crowd out private transfers, even at very low levels of parental income. Although the non-linear models present a more realistic estimation, their study had the same limitation as Secondi's and Liu and Reilly's in that intra-generational and intergenerational transfers are indistinguishable. The transfer variables in this study, i.e. inter-household transfers, include money or gifts given to or received from friends and relatives, and may not equal

[20] They are Shanghai, Wuhan, Shenyang, Fuzhou, and Xian.

private transfers from children to old parents.

Gibson, Olivia *et al.* (2011) used different cross-sectional survey data to investigate the responsiveness of private transfers to household income in four developing countries – China, Indonesia, Papua New Guinea and Vietnam. The data used in their study of China covers 1,199 household samples and was conducted in 30 villages in 6 provinces[21] of rural China in 2000. Their OLS regressions showed that for every one *Yuan* increase in pre-transfer household income in rural China, private transfers reduced by 0.019 *Yuan*. Gibson and his colleagues further used the number of rooms and size of the house to instrument pre-transfer household income and found a small value of negative transfer derivative (-0.037). Gibson and his colleagues adopted the conditional least square (CLS) threshold model from Cox, Hansen *et al.* (2004) that allows for the transfer derivative change if the recipient's pre-transfer income is above a certain level (the threshold). Their results showed that for rural Chinese households whose annual incomes were below 25,450 *Yuan*, each one *Yuan* increase in pre-transfer income reduced private transfers by 0.042 *Yuan*; for households whose annual incomes were above 25,450 *Yuan*, pre-transfer income almost had no effect (-0.004) on private transfers. The authors concluded that because of the small magnitude of transfer derivatives, there was no evidence to support the crowding-out hypothesis (in rural China). Gibson, Olivia *et al.*'s study of rural China shares the same limitations as Cai, Giles *et al.* (2006)'s study in that intra-generational and intergenerational transfers are indistinguishable. These studies examined transfer behaviours among households. However, money transfers between children's household and parental household may be different from those between children and parents directly. This is particularly the case in rural China where co-residing with children is prevalent and inter-household

[21] The provinces are Hebei, Liaoning, Shaanxi, Zhejiang, Hubei and Sichuan.

transfers may be part of resources exchange between children's households.

Chan (2011) used a 2008 pilot survey of the China Health and Retirement Longitudinal Study (CHARLS) conducted in Zhejiang and Gansu Provinces, to examine how the income of older people affected children's transfers. He found that intergenerational transfers are prevalent, as nearly half of the sampled older households received net transfers from adult children. He also found old parents who were more traditional were more dependent on intergenerational transfers. His probit models showed that pre-transfer income, age of head of the household, and chronic diseases (only significant in the Gansu model), were negatively associated with net transfer amounts. However, he failed to obtain statistically significant estimates of transfer derivative from the linear regressions. He claimed that while intergenerational transfers tended to be targeted at needy old parents, there was not sufficient evidence to support only altruistic or exchange transfer motives. The main achievement of this paper is that the CHARLS allows the author to differentiate between intra-generational and intergenerational transfers. However, the assumption of a linear association between the value of intergenerational transfers and the value of recipient's income, failed to predict the transfer derivative. Without further analyses, potential "crowd-out" or "crowd-in" effects were not discussed, and may bias the conclusion.

More recently, Lei, Giles *et al.* (2012) also used the CHARLS to analyse the patterns and determinants of intergenerational transfers. They found the predominant pattern of intergenerational transfers to be from adult children to old parents in these two provinces. Compared with Chan's study, two differences in this study are: a) Lei and her colleagues disaggregated children's transfers into regular monetary transfers, irregular monetary transfers and in-kind transfers; b) Lei and her colleagues restricted samples to non-coresident children for the estimations on transfers. Their regressions, in which pre-transfer incomes were set as three linearly connected segments, showed that parents with higher incomes were less likely to receive transfers, and received a smaller amount given that transfers had occurred, than those whose incomes were among the lowest group. The estimates became insignificant for old parents in the middle and high income groups. They claimed that the negative transfer derivative exists only if parental incomes are at low levels. Moreover, their investigation into adult children's characteristics suggested that children's financial capacity was important for the incidence and amount of transfers given to parents, and children siblings share responsibility of supporting old parents: eldest sons were more likely to provide regular monetary transfers, daughters seemed to be more likely to provide in-kind transfers, while youngest sons were more likely to live with their parents.

2.4 Conclusion

Intergenerational financial transfers today are common and widespread, occurring all over the world, although the direction of the flow is likely to depend on the welfare system of the country and the financial circumstances of the older generation. In developed countries, where the pension system has been set up to ameliorate poverty in old age, intergenerational transfers are more likely to be downward: from old parents to children. This serves to provide children with insurance against unexpected economic shocks, such as unemployment. In developing countries with a lack of state support for people in their old age, intergenerational transfers are more likely to be upward, from children to old parents, which have become an important income source of financial support for older persons. Intergenerational transfers are vital, because in all types of economies they help to smooth out consumption over the economic life cycle and, in particular, finance income deficits during the long “dependent” periods of childhood and old age.

Empirical analyses which have considered how attitudinal characteristics of parents and children determine transfer behaviours, and have distinguished different transfer motives, have been of great interest within academic and policy-making circles. Several theories modelling intergenerational transfer motives were reviewed, among which the altruism and exchange hypotheses are fundamental to most other theories, and form the basic framework in this field. Estimating the transfer derivative, because it helps improve the effectiveness of social welfare programmes, and distributes the cost of ageing between generations in society.

Social scientists have long made efforts to empirically test the motives behind making intergenerational transfers and to show whether public transfers would crowd out private transfers. Studies from the US and Europe have demonstrated “crowd-out” effects, but of small magnitude. Scholars argued this may be because in developed countries, where both the young and older population have been protected by large public transfers for a century, most private transfers have probably been crowded out, thereby reducing the sensitivity of the transfer derivative. Developing countries, and in particular China, present an interesting setting in which to test transfer motives and the crowding out effect. On the one hand, within Confucian paradigm, traditionally, old parents are taken care of by their adult children. Data from a variety of surveys has found upward private transfers are common, and still important, economic resources for older Chinese people. At the same time, China’s social security system is underdeveloped; it covers only about one-half of its current population of older people. More importantly, China’s on-going pension reform programme is likely to increase both pension coverage and benefits for its older people, providing an exogenous shock to test whether the increase in public transfers will crowd out private transfers.

Despite its clear research and policy significance, empirical work on intergenerational transfers among Chinese people is only a relatively recent phenomenon. However, a growing body of research has demonstrated that children's and parents' characteristics are key to determining the nature of intergenerational transfers. Nevertheless, most of the previous empirical work (e.g., Cai, Giles *et al.*, 2006; Liu & Reilly, 2004; Secondi, 1997) used household-level data, and was unable to differentiate between intergenerational transfers and intra-generational transfers, which may bias the estimation of transfer derivatives, because the intra-generational transfer motive is different from the intergenerational transfer motive. Moreover, most of the previous work (e.g., Chan, 2011; Lee & Xiao, 1998; Liu & Reilly, 2004; Secondi, 1997) assumes a single, linear regime of transfer derivative, which is not realistic, and may be misplaced. This is because donors may have several different motives for the private transfers they make, and may switch from one motive to another as the recipient's income increases. Finally, most of the previous work (except Lee & Xiao, 1998) used data at city/county level or at provincial level, which lacks generalisation.

My data and methodology have some advantages compared to previous empirical studies of intergenerational transfer within China. Firstly, the data I use in this thesis cover around 20,000 individuals, aged 60 and over, from 20 provinces, making them more nationally representative. Secondly, the survey asked and collected information from older people directly, allowing me to differentiate between intergenerational transfers and intra-generational transfers. Thirdly, the non-linear methods I adopt to investigate transfer derivatives have enabled me to take into account co-existence of multiple transfer motives and present a non-parametric relationship between public transfers and private transfers. Detailed information on data and methodology will be presented and addressed in chapter 5. Before heading to the empirical analyses, I begin by two scene-setting chapters which will provide the backgrounds of China's demographic trend and old-age security system, in order to understand why the issue of old-age support is important and urgent in China.

Chapter 3: Trends in demographic change and population age structure in China

> *"Population ageing is the inevitable consequence of the classical demographic transition which began in Europe in the eighteenth and nineteenth centuries and entailed first a decline in mortality over almost 150 years followed by a dramatic and fairly rapid decline in fertility."* (Harper, 2006, p. 36)

Over the past few years, the sharp demographic transition in China has captured the imagination of economists and sociologists all over the world. In the context of population aging at a rapid speed and on a large scale, China's public and private old-age support system is in urgent need of better evaluation, calling for massive research. Demographic transition characterised by decline in fertility and mortality has placed constraints on public and private transfer capacity and has made China an important case in the study of intergenerational transfers. For future older people, it is important to study the demographic trend so that we can have a better understanding of future scenarios regarding intergenerational transfers and old-age support.

In this chapter I will depict recent and projected demographic trends in China and their likely implications. I begin by looking at data on population growth and its components (births, deaths, and international migration) in section 3.1, before considering the implications of these for the age structure of the population in section 3.2. Actions and policy responses by the Chinese government to tackle ageing issues will be addressed in section 3.3, and I conclude by discussing the implications of these demographics in section 3.4. The Chinese *Yuan* to U.S. dollar exchange rates from 1990 to 2011 are provided in Appendix 3.1.

The analysis of demographic trends in this chapter is not divided into two parts, comparing urban and rural differences. This is because neither the China Statistics Yearbooks nor the World Population Prospects have separate information on urban and rural areas[22]. The only dataset that would allow investigation of the urban-rural differences in demographic trends is the China Census data. However, the China Census data is not for public use. The Chinese Statistics Yearbooks only provide separate information on different regions (provinces or municipalities). We need to bear in mind that every province or municipality (or even city and county) in China includes urban and rural areas. Therefore, in terms of populations ageing and its impacts, urban and rural differences are not necessarily, or likely to be, the same as regional differences. Figure 3.1 shows the percentage of people aged 65 and over and the mortality rate by regions. The Chinese Statistics Yearbooks do not have an indicator of urbanisation. Industrial output value per capita is used to approximate urbanisation. Figure 3.1 ranks all provinces/municipalities from the lowest industrial output value per capita (Tibet) to the highest industrial output value per capita (Shanghai) from left to right. If a higher industrial output value per capita indicates a more urban status, the figure should rank the least urban to the most urban from left to right. From Figure 3.1, we can see that neither the percentage of people aged 65 and over nor the mortality rate vary with the industrial output value per capita across provinces/ municipalities. Therefore, I decide not to show urban-rural difference but to quote second hand analyses from other studies[23] in section 3.2.

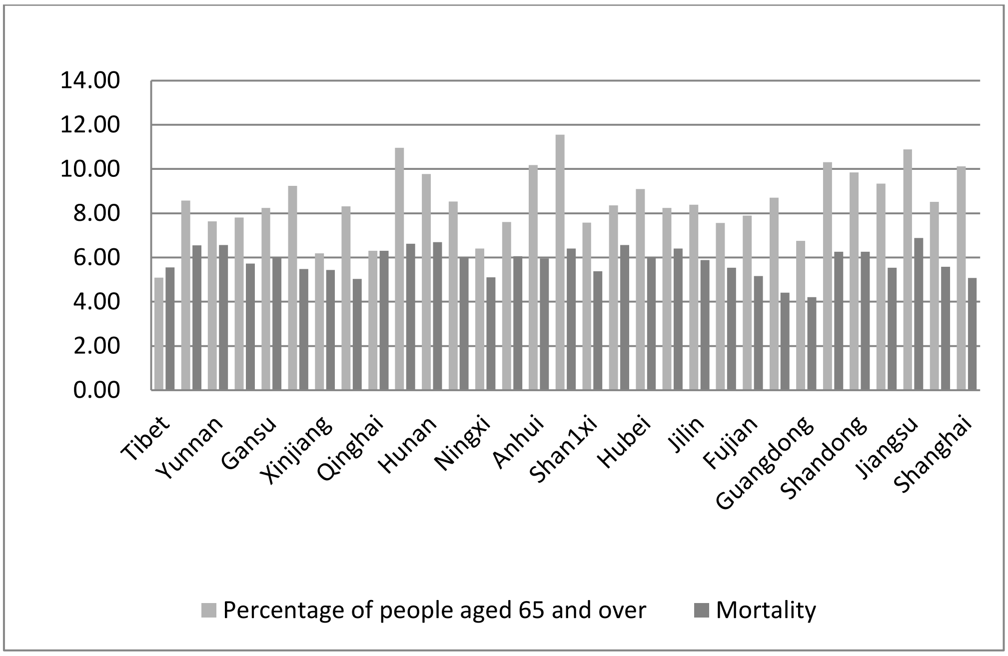
Population ageing (also known as demographic ageing) is characterized by the increasing number of older people and the growth of this group as a proportion of the total population. It refers to the process of the shifting in the age structure of a population toward an older society. By the United Nations definition of 1993, a society becomes an "ageing society" when the proportion of the population aged 60 and over is more than 10

[22] For the Chinese Statistics Yearbooks, the only information on urban-rural division is the annual aggregate population in urban and rural areas.

[23] These include studies and announcements by government units (e.g. China National Committee on Ageing) who have access to the dataset that allows for urban-rural comparison.

per cent, or the proportion aged 65 and over is more than 7 per cent of the total population. As a direct consequence of the on-going global fertility transition (decline) and of mortality decline at older ages, population ageing is expected to be among the most prominent global demographic trends of the 21st century in industrialised and developing countries (Gavrilov & Heuveline, 2003). Population ageing has many important socio-economic and health consequences, presenting challenges for economic development (e.g. financing social security systems and the change in the age structure of the labour market) and public health (e.g. Medicare and related programmes).

Figure 3.1: *Percentage of people aged 65 and over and mortality by provinces*



Source: China Statistics Yearbook 2011

Population ageing, and with it the associated problems of support for older people (e.g. pension system), is taking place all over the world. There is no doubt that China is currently the country with the largest population in the world[24]. The latest official statistics from the National Bureau of Statistics of China (NBSC, 2011) show that by

[24] India had the second-largest population of 1.22 billion in 2010 (UNDESA, 2011).

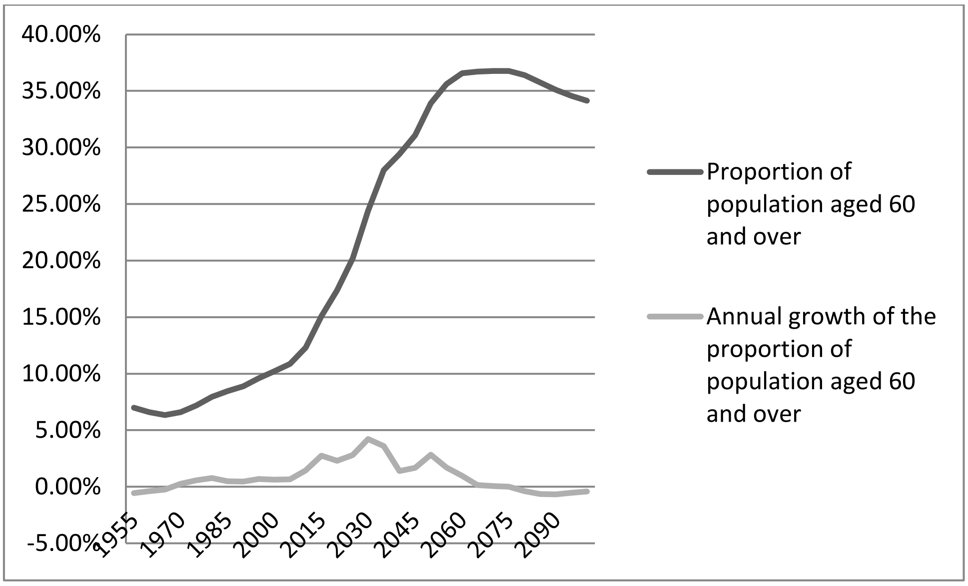
November 2010, China had a population of 1.34 billion[25], while the world as a whole is estimated to have a population of 6.9 billion. China therefore accounts for 20 per cent of the world's population (UNDESA, 2011). In other words, nearly one fifth of the world's population lives in China. With respect to ageing issues, China is arguably the most important developing country in Asia. Population ageing in China began in the late 1960s, when both fertility and mortality started to decline, and the proportion of the older population increased, which served to alert both Chinese and international scholars (e.g. Harper, 1992; Sankar, 1989). Under the UN definition, China became an ageing society in the end of the 20th century, when the 2000 census (NBSC, 2011) showed that the proportion of people aged 60 (65) or over accounted for 10.45% (7.09%) of the total population.

Recently, Chinese census statistics (NBSC, 2011) show that in 2010, the number of older people aged 60 or over was 177.6 million, accounting for 13.26%[26] of the total population, and the number of older people aged 65 or over was 118.8 million, accounting for 8.87% of the total population. Moreover, those aged 60 or over (aged 65 or over) in China account for around 20% of the total population of those aged 60 or over (aged 65 or over) in the world. With over 100 million people at the age of 65 and over, China remains the country with the largest older population. As pointed out more than two decades ago, "One fifth of the world's elderly population lives in China" (Sankar, 1989, page 199). Besides its magnitude, the speed of population ageing in China is also worth mentioning. One possible measurement of the speed or the rate of population ageing is the annual growth of the proportion of older persons[27]. Figure 3.2 provides such information: The proportion of the Chinese population aged 60 and over is

[25] The number excludes population in Hong Kong, Macao and Taiwan Province.
[26] The UNDESA estimates a smaller number of 165.2 million, or 12.3% of the total population.
[27] It is calculated by the proportion of older population this year minus the proportion of older population last year.

predicted to continue increasing until 2060; the annual growth of the proportion of the population aged 60 and over is predicted to continue increasing until 2035. Therefore, the speed of population ageing will accelerate in the near future.

Figure 3.2: The proportion of population aged 60 and over



3.1 Towards an Ageing China

Population change in a society is calculated by subtracting the number of deaths from the number of births, and adding net international migration. Although in the 20th century China experienced relatively large international migration flows because of historical events - foreign invasion and civil war - in recent years net emigration has been relatively low. According to the United States Census Bureau International Data Base[28] (IDB), in 2011, China lost 33 persons per 100,000 population net to international migration. This leads us to focus here on other, more predictable, events - i.e., mortality and fertility - that are currently playing a more important role in the shaping of demographics of China.

Like other developing countries, China is going through a period of profound

[28] Available at: http://www.census.gov/population/international/data/idb/informationGateway.php.

demographic changes known as the demographic transition (e.g. Choudhry & Elhorst, 2010; Hussain, 2002). This section aims at providing an overview of past and future demographic dynamics in China, mainly based on population estimates and projections produced by the Population Division of the Department of Economic and Social Affairs, United Nations (UNDESA). Given the uncertainty of future demographic changes, the United Nations presents a variety of projections based on different assumptions (High, Median, Low and Constant variant) about the future trends of demographic variables, particularly fertility. This chapter adopts the medium-fertility variant, which is generally regarded as the most likely scenario among the variants. Therefore, all tables and figures in this chapter are calculated from the UNDESA data, unless otherwise specified.

The population ageing process in China shares certain characteristics and experiences with other ageing societies, and at the same time has some unique characteristics which have resulted from its history of social and demographic change. Two such special factors are of particular importance in shaping China's population age structure. The first is a dramatic fertility reduction within a relatively short time period, which has rarely been seen elsewhere in the world. The decline in fertility actually started as early as in the 1950s in parts of urban areas, and had extended to the whole China by the beginning of the 1970s, when the government called for "later marriage, longer birth intervals and fewer births" (Lavely & Freedman, 1990; Wang, 2001). The other factor is the reduction in mortality as a result of improvement of health.

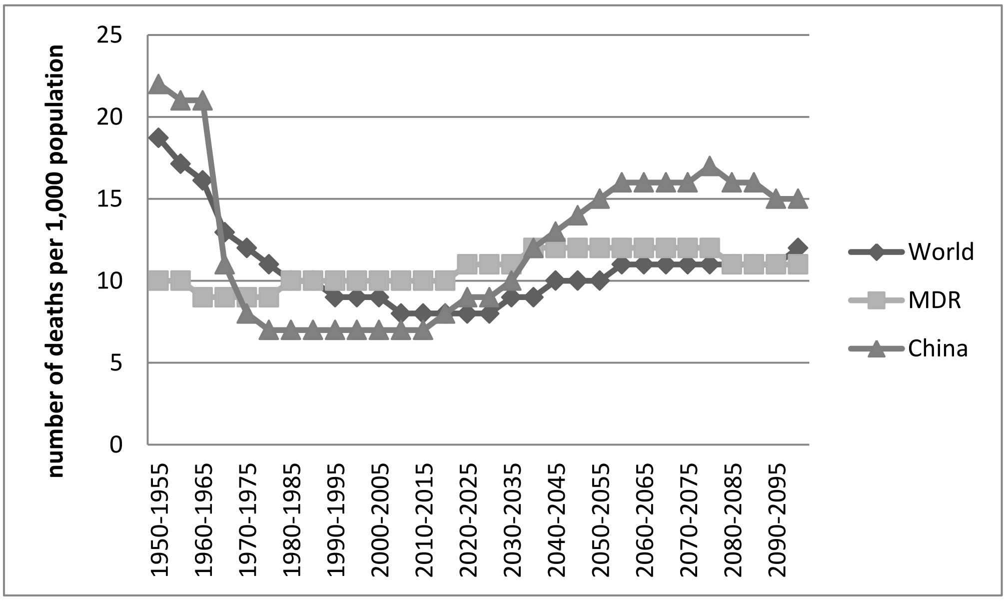
3.1.1 Mortality

Since its establishment, China's crude death rate[29] (CDR) has been decreasing dramatically (Figure 3.3). Currently, China's CDR is lower than the world's average level

[29] A crude death rate indicates the number of deaths over a given period divided by the person-years lived by the population over that period. It is expressed as number of deaths per 1,000 population.

and that of the more developed regions (MDRs), and this has been the situation since at least the period of 1965-1970. However, China's CDR is projected to increase in 2015, and to continue doing so until 2080-2085, and is expected to exceed the world's and MDRs' CDR during 2040-2045. The CDR difference between China and the world as a whole is projected to grow throughout the 2030–2080 period, leading to increasingly lower population growth rates in China relative to the world as a whole. The CDR is strongly influenced by the age structure of a population, and increases as a result of population ageing. Indeed, one reason why CDRs will be higher in China than the world as a whole after 2015 is that China's population is, on average, older, and older people have a lower life expectancy than younger people. Life expectancy at birth (LEB) provides another measure by which to compare mortality risks or overall health between regions and across time periods.

Figure 3.3: *Crude Death Rate of the world, China and more developed regions*



LEB indicates the expected number of years that an individual born in a given year is likely to live if the age-specific mortality rates of that year apply during all of that person's life. LEB has been increasing in China and is projected to increase through at least 2010 and converge to the level in MDRs (Figure 3.4). During 1950–55, LEB in China was only 44.6 years, while infant mortality was 122 per thousand births (Table 3.1). The number fluctuated over time until the period 1960-1965. LEB grew sharply to 59.4 during 1965-1970, when infant mortality fell from 121 to 63 per thousand births. From then on, LEB started increasing steadily, as a result of the decline in infant mortality - mainly due to improved control over parasitic, infectious, and respiratory diseases - and the declining mortality across the entire population. As a result, LEB in China has increased by 28.1 years, on average, over the last six decades, reaching 72.7 years in 2005–2010. This means that China's LEB is currently 4.8 years higher than the average level for the world as a whole, and only 4.2 years lower than the average life expectancy in MDRs. Finally, as in almost all countries, female mortality in China tends to be lower than male mortality, which is reflected in shorter life expectancy for men. This gap did not widen as life expectancy increased over the last half-century.

Figure 3.4: *Life expectancy at birth of the world, China and more developed regions*

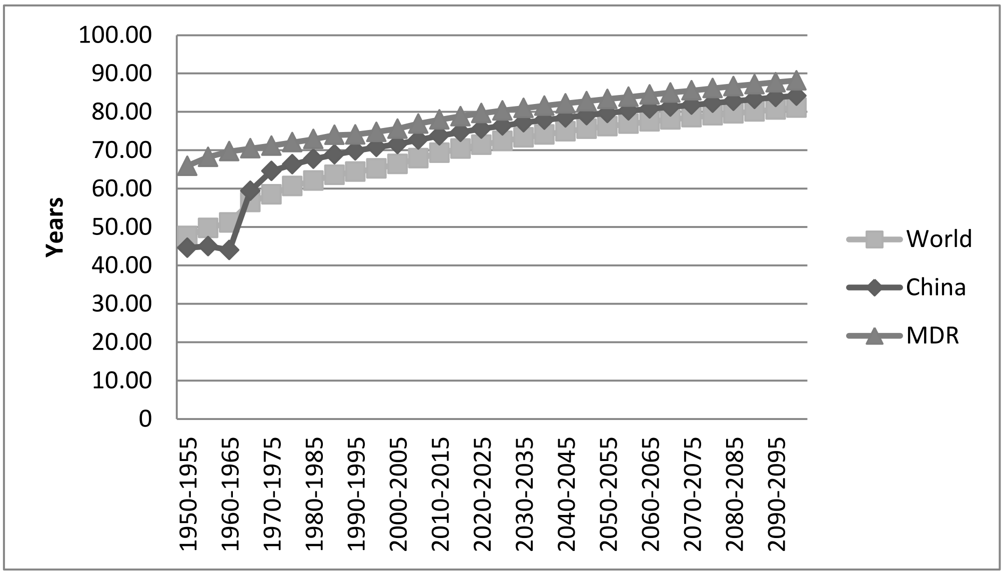
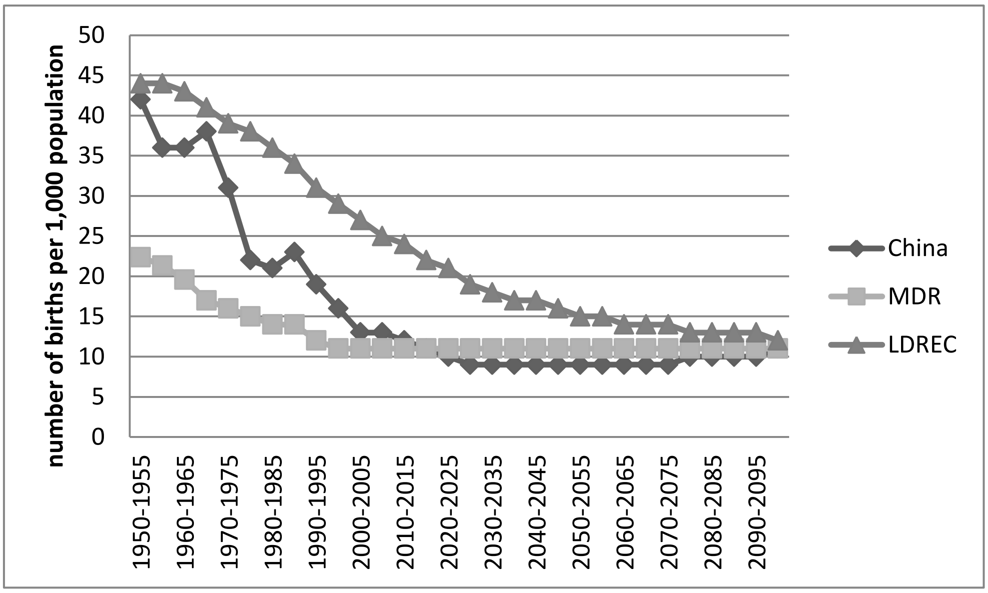


Table 3.1: *Estimates of life expectancy at birth by gender and infant mortality rate in China, 1950–2010*

Five-year period	Life expectancy (years) Total	Men	Women	Infant Mortality (per 1,000 births)
1950-1955	44.6	44.6	44.6	122
1955-1960	45	44.5	45.6	118
1960-1965	44	42	46.4	121
1965-1970	59.4	59.2	59.5	63
1970-1975	64.6	63	66.1	47
1975-1980	66.3	64.8	67.8	42
1980-1985	67.7	66.2	69.2	38
1985-1990	68.9	67.4	70.5	34
1990-1995	69.9	68.4	71.6	30
1995-2000	70.8	69.3	72.5	27
2000-2005	71.6	70	73.4	25
2005-2010	72.7	71.1	74.5	22

3.1.2 Fertility

Figure 3.5: *Crude birth rate of China, more developed regions and less developed regions*



In China, the number of births has markedly exceeded the number of deaths. Accordingly, the decline in fertility has been the main factor reshaping the population age structure in China, despite the significant decline in mortality. During the 1950-2010 period, the crude birth rate[30] (CBR) in China has been declining, and is estimated to fall from 42 births per 1,000 population to 13 births per 1,000 population. The non-declining CBR between 2000 and 2010 is likely to be an "echo effect" of the baby boom which followed the Cultural Revolution, i.e., the women born during that period are now having babies. Compared to other regions, CBR in China has been higher than in MDRs, but lower than LDRs (Figure 3.5). Since 1970-1975, the difference between China's CBR and that of LDRs has widened, while the CBR in China has been getting closer to MDRs and finally become lower than MDRs during 2020-2025.

The number of births in a nation is not solely reflected by the CBR, but instead is the product of two components: the average number of births per woman of childbearing age, and the number of women of childbearing age. If the number of women of childbearing age is declining, the number of births can decrease, even if the number of births per woman is increasing. The term "population momentum" is used to describe such a phenomenon. Both measures will be discussed in turn.

The total fertility rate (TFR) is a measure of fertility indicating the average number of lifetime births per woman[31]. Because TFR is not affected by the number of women of childbearing age in the population, it is generally considered a better measure than the CBR for comparing fertility levels between nations and time periods. Over the last six decades, China's TFR dropped drastically from 6.11 children per woman during 1950–1955, to 1.64 children per woman during 2005-2010 (Table 3.2). Notably, the TFR in China has been below replacement level since 1990-1995, and is projected to be decreasing until 2015-2020.

[30] A crude birth rate indicates the number of births over a given period divided by the person-years lived by the population over that period. It is expressed as number of births per 1,000 population.
[31] More precisely, the number of births a woman would have in her lifetime if at each age she experienced the age-specific fertility rates of that year.

Table 3.2: *Estimates of fertility in China, 1950-2010*

Five-year period	Crude Birth Rate (per 1,000 women)	Total Fertility Rate	Year	Number of women of childbearing age (15-49) (in millions)	Growth rate of Number of women of childbearing age
1950-1955	42	6.11	1955	137.06	0.04
1955-1960	36	5.48	1960	143.69	0.05
1960-1965	36	5.61	1965	156.12	0.09
1965-1970	38	5.94	1970	180.55	0.16
1970-1975	31	4.77	1975	203.36	0.13
1975-1980	22	2.93	1980	230.94	0.14
1980-1985	21	2.61	1985	269.11	0.17
1985-1990	23	2.63	1990	305.10	0.13
1990-1995	19	2.01	1995	325.39	0.07
1995-2000	16	1.80	2000	342.74	0.05
2000-2005	13	1.70	2005	356.87	0.04
2005-2010	13	1.64	2010	363.76	0.02

Figure 3.6: *Total fertility rate of China, more developed regions and less developed regions*

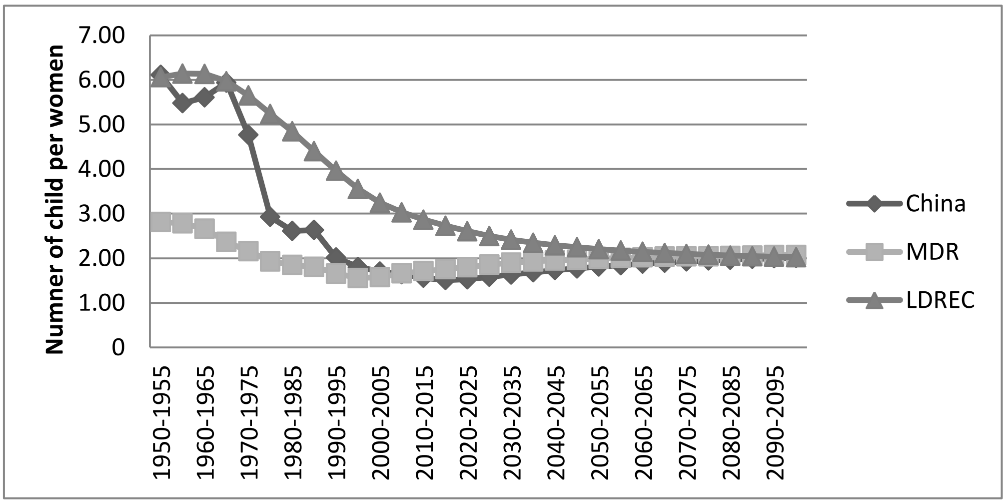
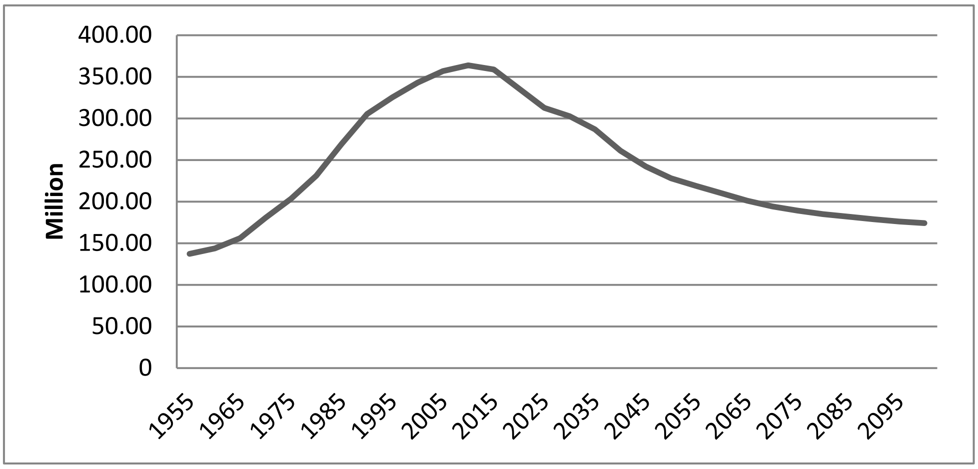


Figure 3.6 shows trends in TFR for China, MDRs and less economic developed regions excluding China (LEDECs) between 1950 and 2100. China's present TFR is slightly lower than its counterparts in MDRs (1.66 children per woman), and is much lower than in LEDECs (3.03 children per woman). This means over the course of a lifetime, each Chinese woman is currently having an average of in excess of one less child than each woman in another LEDEC. Although TFRs in all regions are expected to gradually converge around the replacement level over the projection period, China has experienced a lower TFR than MDRs since 2000-2005, and an even significantly lower

TFR than LEDECs over all periods. Although the number is predicted to begin increasing toward 2.01 as we approach 2095-2100, China's TFR is expected to remain below the replacement level (approximately 2.1 children per woman) for the next four decades.

The number of women within the childbearing age range is another key factor in determining the number of births in a country. Today, China has a sizeable female population of childbearing age (ages 15–49). However, the UNDESA's estimates (Table 3.2) show the number of women of childbearing age in China has been increasing since 1950, but has been doing so at a decreasing rate since 1990. Moreover, the number of women of childbearing age is projected to begin diminishing in 2015, and over the entire period of interest (until at least 2100) (Figure 3.7), leading to negative momentum.

Figure 3.7: *Number of women of childbearing age*



Today, the fertility rate in China is well below the replacement level, and has declined to a level that is amongst the lowest in the world. Furthermore, unless there are major discoveries and advances in medicine, or changes in life conditions, the current 72.7 year life expectancy at birth for both sexes in China is not likely to vary as dramatically as the shift in life expectancy experienced during the initial 20 years following the founding of the People's Republic of China. Fertility has played the most important role in population dynamics, and in determining the population age structure of China. Since the age structure of the population is primarily a result of previous levels of fertility, those levels will continue to have an impact even if fertility rates start growing gradually in the next few decades.

Unlike in other aged or ageing societies, the low fertility rate of a Chinese couple is to a large extent caused by the country's birth control policy rather than by a decline in willingness to give birth. The One-Child-Policy has influenced China in many important ways, one of which has been to cause fertility to decline dramatically. Thirty years after it was first introduced, China's One-Child-Policy is credited with cutting population growth to an all-time low, and has unarguably accelerated the process of population ageing. China announced its one-child-per-couple fertility policy in 1980, as an emergency measure to slow population growth in order to boost economic development, despite the fact that this perspective on the relationship between population and development is controversial. Scholars describe the policy as "the largest and most extreme social experiment in population growth control via government intervention in human reproduction in world history" (Wang, 2005). Leaving aside this controversial debate[32], scholars (Baochang, Feng *et al.*, 2007; Ebenstein, 2010; Zhang & Goza, 2006) have reached a consensus that the One-Child-Policy has undoubtedly contributed to China's low fertility rate, as well as other social issues such as an unbalanced sex ratio and particularly old-age support.

The One-Child-Policy, however, is not strictly a one-child-per-couple and "one-size-fits-all" policy as its wording suggests. Rather, it has always been restricted to ethnic Han Chinese living in urban areas. Several policy readjustments have been made to reduce the economic and political costs of dogged resistance from the population and the issue of population ageing. For instance, ethnic minorities, which account for 8.49% of

[32] For more details on debates on the One-Child-Policy, please see Wang (2005).

the total population in China (NBSC, 2011), are allowed a second or even a third birth[33]. Moreover, to accommodate the strong desire for sons in rural areas, rural couples (citizens with agricultural *hukou*) whose first child is a daughter are allowed a second child. Therefore, rural couples holding an agricultural household registration have been required to adhere to a one-and-a-half-child policy. For both urban and rural areas, the policy allows couples in which both parents are only children to have two children. Apart from this so called “couple single” (*shuang du*) policy, only a few exceptions exist for urban couples holding non-agricultural household registration. For example, couples whose first child is physically handicapped, and couples in a second marriage who do not each have a child from the previous marriage, are allowed a second child. More recently, proposals such as allowing couples in which one spouse is an only child to have two children are being discussed. Scholars have even proposed a two-child policy to replace the current One-Child-Policy.

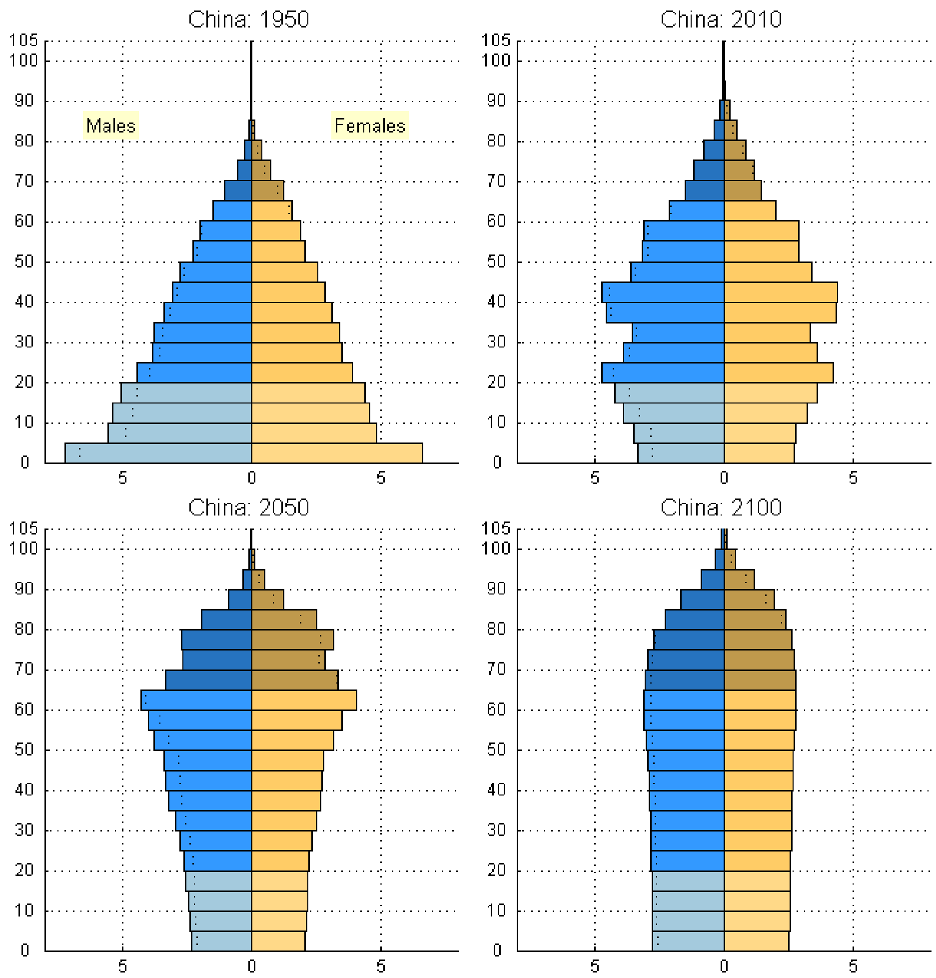
3.1.3 Population age structure

The trends in mortality and fertility discussed above affect the present and projected age distribution of a population. Demographers typically use population pyramids (also called age structure diagrams) to graphically depict the age and sex distribution of a population. Such figures are called pyramids because, historically, for most nations, particularly in those with a growing population, they form the shape of a pyramid, with a wide base representing large numbers of younger cohorts, and more narrow bands near the top representing smaller numbers of older cohorts near the end of their natural life span. Figure 3.8 shows population pyramids for China for the years 1950, 2010, 2050 and

[33] A direct consequence is that the population of ethnic minorities went up from 6.68% of the total population in 1982 to 8.49% of the total population in 2010.

2100. The age-sex structure in 1950 is a good example of the classic pyramid shape.

Figure 3.8: *Population age pyramid 1950 – 2010*



Source: United Nations, Department of Economic and Social Affairs, Population Division (2011): World Population Prospects: The 2010 Revision.

A year after its founding in 1949, China's population age structure was largely a base-heavy one, characteristic of a young and growing population. However, the pyramid shape is no longer to be seen for the 2010 population of China and demonstrates two population bulges. The smaller cohorts of persons aged 0-20 in the 2010 pyramid (born between 1990 and 2010) are likely to reflect low fertility due to the One-Child-Policy. In the 2010s China’s fertility is well below the replacement level, and the number of women who are of childbearing age will decline gradually. As a result, the number of new births will stop growing, and younger cohorts will become slightly smaller than those immediately older. In half of a century, China's age structure has moved from one that is characterised by a young and growing population to one that is characterised by to an old and declining one.

In future years, China’s population age structure is expected to have a much smaller base and is more jagged in shape. Because fertility rates in China are expected to remain below replacement levels and the number of women of childbearing age is expected to decrease, each birth cohort is smaller than the one above it in the population pyramid. The “bulges” of the population pyramid are projected to move upward in coming years as the major cohorts age. For example, in 2050, the large cohort that is now 15-25 will be 55-65. Consequently, there will be a considerably higher proportion of older people than there are now; for example, there are projected to be 33.9% people in China aged 60 and over in 2050 and the proportion will grow up gradually to 34.1% in 2100, compared with 12.15% in 2010.

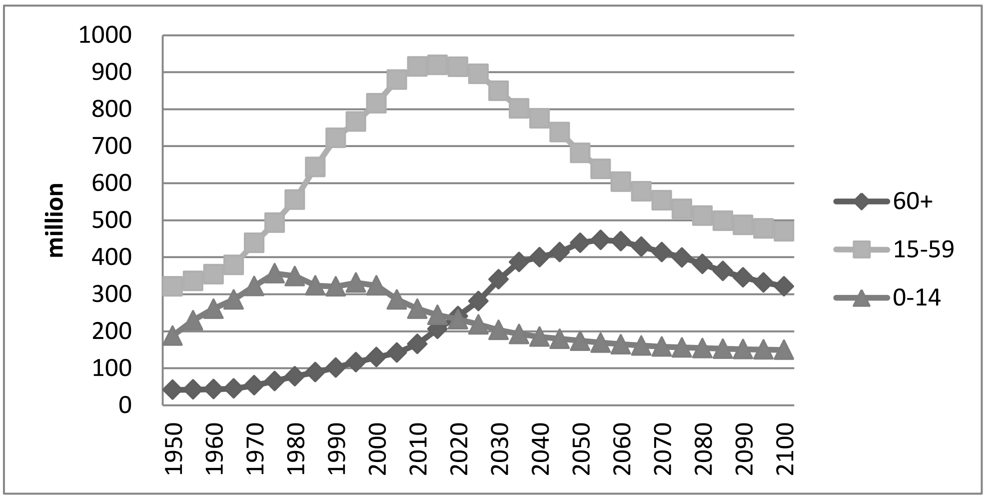
3.1.4 Population growth and dependency ratio

China’s total population has been growing at diminishing rates (Figure 3.9). More specifically, the growth of China’s older population is much faster than that of its total population. Six decades ago, the average annual population growth rate in China was 10.8 per cent. In 2010, the growth rate had dropped to 2.6 per cent, and by 2025 the population is expected to be growing at a rate close to zero (approximately 0.5 per cent). However, different trends are observable if we turn to specific age groups: while the child population (aged 0–14) has been declining in absolute numbers since the beginning of the 21st century, the adult population (aged 15–59) has been growing at a declining rate until the end of the 2010s when it begins a steady reduction, and the growth rate of the older population (aged 60 and over) is projected to increase until 2015. After that, the growth rate of the older population might begin to fall, but is likely to remain well above the growth rates of the other age groups.

Figure 3.9: *Population growth rate*

In absolute numbers, the total population increased 2.4 times over the last six decades—from 551 million in 1950 to 1.34 billion in 2010—and is projected to grow steadily until 2030 when it will start shrinking throughout the 21st century to less than 1 billion in 2100. Despite them all being U-shaped, significant variation exists among the population sizes of different age groups over time. While the size of the adult population will reach its peak in the mid-2010s, the number of older people is expected to keep growing dramatically, and will reach its maximum value of 443 million in 2060; more than 10 times the number in 1950 and 2.7 times the number in 2010. The child population stopped growing in 1970 and is projected to keep the downward trend until at least 2100. In other words, population growth between 2015 and 2060 will be entirely driven by growth of the older population (Figure 3.10). This circumstance will definitely make population ageing one of the key demographic phenomena of this era.

Figure 3.10: *Population Number by age groups*



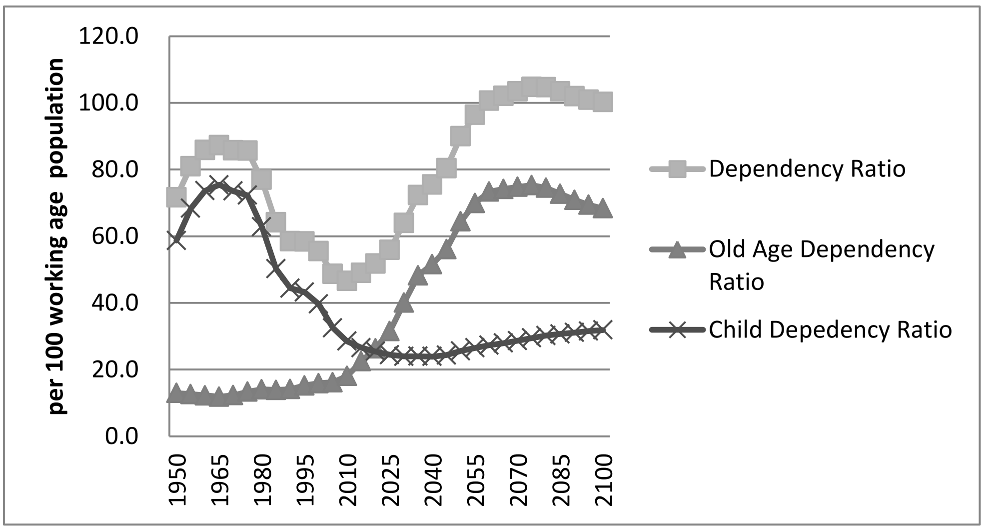
There is little doubt that population ageing in China will continue to accelerate in the near future, which means that China is entering a new historical era. The changes in population age structure discussed above will have an impact on the percentage of the population in the working-age group (aged 15-59) - those of the population who will be able to (but not necessarily will) contribute to the economy - and the percentage of population in the dependent age group (aged 0-14 and 60+), presumed to be too young or too old to support themselves through labour market activity, and who will therefore need to be supported by others, typically the family or the state.

Because contribution and consumption activities of individuals vary depending on the stage of life cycle, changes in age structure tend to affect the economic development of a nation. A high proportion of working age group can boost economic growth, because a larger share of workers together with a lower level of spending on dependent persons tends to accelerate the accumulation of capital. By contrast, a larger share of economically dependent persons in the population (children and older people, in general) normally constrains economic growth, since a substantial proportion of resources is allocated to fulfil their needs.

For this reason, the dependency ratio, which is calculated as the ratio of the number of people in dependent age groups to the number of people in the working-age group and expressed as the number of people in dependent age groups per 100 working-age people, is usually considered as a useful indicator of the potential impact of demographic changes on socioeconomic development. The dependency ratio can be decomposed into a child dependency ratio, expressed as the number of children for 100 working-age people, and an old-age dependency ratio, expressed as the number of older people for 100 working-age people.

The trends of dependency ratios are shown in Figure 3.11. Between 1950 and the mid-1970s, China's dependency ratio rose as a result of the increase in the child population, until reaching a maximum value of 86 dependents per 100 people of working age. Following the decline in fertility rates in the mid-1970s, the dependency ratio began decreasing significantly until 2015, when the ratio will reach its minimum value of 49 before growing again, due to the increasing proportion of older people. The dependency ratio will then increase at an increasing rate until 2060 resulting from the drastically ageing population.

Figure 3.11: *Dependency ratios*



Most recently, in 2010 the UNDESA estimates showed that there were 46.6

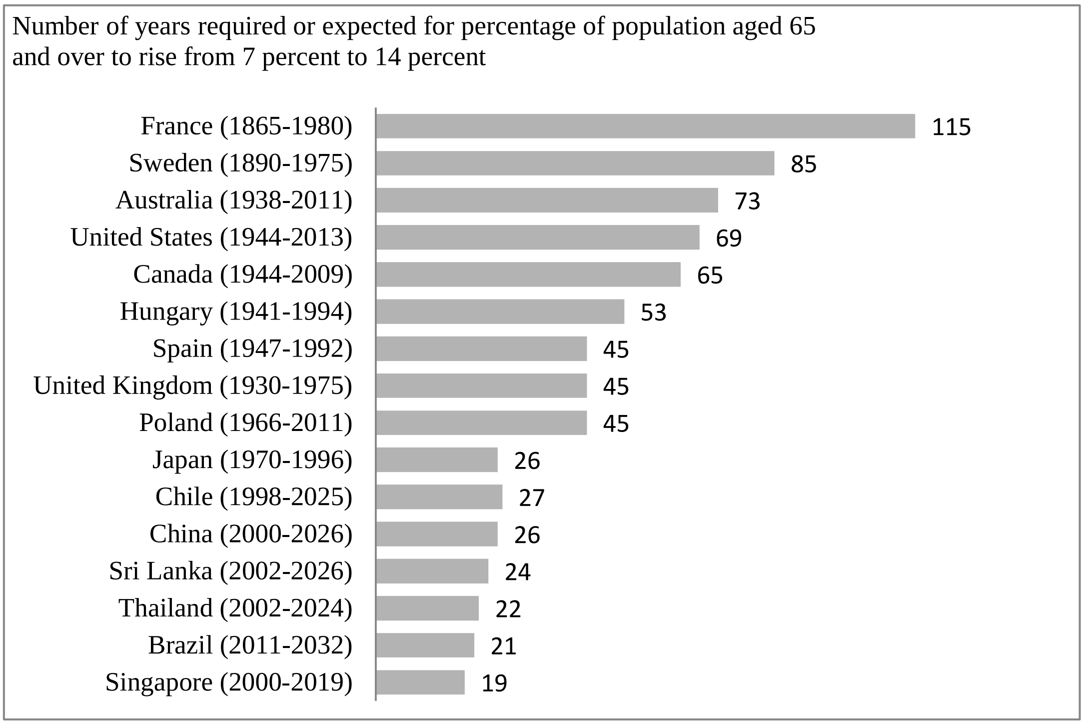
dependents per 100 people of working age, of which 61% are children and 39% are at least 60. The child dependency ratio has decreased since the beginning of the 1970s, and is expected to experience a steady decline until 2014 (23.9 for every 100 persons of working age), from which point it will increase slowly. By contrast, despite fluctuations after the founding of new China, the old-age dependency ratio has increased modestly since the mid-1960s. Furthermore, the old-age dependency ratio started growing at an increasing rate in the year 2005, and is expected to maintain a positive growth rate until the mid-2050s. In a half century the dependency ratio is projected to be 100 dependent people for every 100 people of working age, of which the percentage of children will drop to 27% while that of older people will rise to 73%.

3.2 Chinese characteristics of population ageing

Population ageing is a new phenomenon in China, and will proceed upon a different trajectory from those followed by the more developed countries. This makes it difficult to draw insights from previous experience. Aside from its great magnitude, several features of China's population ageing deserve attention. Because this chapter aims to provide a general background of demographic transition, however, I list only a few of them here. One of the most important is the speed - and as a consequence the timing - of population ageing in China. For developed countries it generally takes about 100 years to become an ageing society due to the birth rate reduction, while it only took a little over 20 years for China to reach the initial stage of the ageing society, from the reduction of the birth rate starting in the 1970s to early 1980s to the beginning of this century (Harper, 2006). Moreover, the speed of population ageing in China is not likely to slow down in future. The time it will take China to attain a substantial proportion of people above the age of 65

– from 7 per cent to 14 per cent – is less than half the length of time it will take the United States, and between one quarter and a half of the time that it took a Western country to attain similar levels (Figure 3.12). Beside this, China's rapid growth rate of older population is also attributed to its dramatic socioeconomic development and improvements in health.

Figure 3.12: *Speed of population ageing in selected countries*



Sources: Kinsella and Gist (1995), Figure 1.2; Kinsella and He (2009), Figure 2-6.

Rapid ageing is taking place in a China that has not been able to generate sustained high standards of living. Instead, China is still undergoing structural change, and is in transition from a command to a market economy. In most of today's MDRs, population ageing has occurred gradually over the course of centuries, allowing them time to adapt to their demographic evolution. For instance, it took more than a century and nearly a century respectively for France and Sweden's population aged 65 and over to grow from 7 per cent to 14 per cent of the total population (Figure 3.12). Moreover, the per capita GDP of industrialised countries is generally more than US$5,000 or even more than US$8,000 when transitioned to an ageing society (Harper, 2006). By contrast, the per capita GDP of China when it firstly started to become an ageing society, in 2001, was only less than US$1,000[34] (NBSC, 2002), which is much less than its developed counterparts. The timing of the ageing transition in China is unique, as China will be the first major developing country to become an ageing country before it becomes a moderately developed country (England, 2005, ch.1).

3.2.1 Empty nest families

Rapidly increasing labour mobility, and declining numbers of children, have produced changes in living arrangements, and have generated the widespread phenomenon recognised by Chinese scholars as "empty nest families" in both urban and rural areas. The term "empty nest families" is translated from the Chinese word *kongchao jiating,* meaning families with older people living alone and not co-residing with adult children. Rapid urbanisation and increasing income inequality between cities and villages, and between regions, has "pushed" and "pulled" workers from rural to urban areas, and from less developed to more developed regions. Migration has a significant economic and social influence on labour-sending areas, particularly for underdeveloped regions. For example, rural to urban migrants have been expected to earn more money in cities and send remittances back to the countryside. Furthermore, migration has become an important strategy for survival and improvement of living standards of Chinese rural households. An early study (Cai, 1997) has shown that migrant remittances contributed to as much as 18% of household income in rural China. According to the NBSC statistics (2011), there was a "floating population" of about 230 million; in other words people's

[34] The per capita GDP of China in 2001 was 7,543 Chinese *Yuan* at 2002 price level, converting to US$911 using the exchange rate in 2001 (8.28).

living locations different from their residential registration locations, by the end of 2010. Although there are no official statistics, it is likely that there were more than 140 million rural-to-urban migrants working in cities in 2010.

Massive out-migration, together with the One-Child-Policy, has reduced household size and raised the rate of empty nest families. An official statistic (China National Committee on Ageing, 2011a) shows that the ratio of left-behind older persons is over 50% in urban areas, reaching nearly 70% in some large and middle-sized cities. By contrast, there are about 40 million left-behind older persons, accounting for 37% of older population in rural China. Recent empirical studies (Palmer & Deng, 2008; Zeng & Wang, 2003), using nationally representative data, have shown a rising trend of older people living alone or with their spouses, rather than with their children, and they anticipated that this trend would persist in the future. Although such change in living arrangements of older people is also due to changes in social attitudes and population mobility, the reduction in fertility and, as a result the diminishing number of new born children, and shrinking household size, have contributed in larger part to this trend. As shown by the census data (Table 3.3), average household size in China has reduced from 4.41 in to 3.10 in 2010.

Table 3.3: *Average household size*

Year	Household size
1953	4.43
1964	4.33
1982	4.41
1990	3.96
2000	3.44
2010	3.10

Source: China Statistics Yearbook 2011 (NBSC 2011)

3.2.2 Regional difference

China's population ageing is more serious in rural areas than that in urban areas (Zeng & George, 2000). The census (China National Committee on Ageing, 2007) shows that in 2000 there were 85.6 million old people in rural areas, accounting for 65.8% of China's older population. In addition, economically developed regions in eastern China demonstrate a speedier ageing process than that in less economically developed regions in the west (Dong, 2011). For example, Shanghai became an aged society in 1979, while the proportion of older population rose over 10 per cent in 2012. By the end of 2004, 11 provinces[35] had a proportion of old population over 10 per cent, among which 8 are more developed and eastern provinces (China National Committee on Ageing, 2007).

In general, regions with lower fertility and mortality have an older population. Because the One-Child-Policy was implemented earlier and more strictly in urban areas than rural areas, urban Chinese couples will experience a lower fertility rate than rural Chinese. Moreover, the better quality and higher coverage rate of health care in urban areas implies a lower mortality rate in urban areas than that in rural areas. A WHO survey (Chatterji, Kowal *et al.*, 2008) confirms this, by showing that urban residents have higher mean health scores[36] than their rural counterparts. Therefore, if fertility and mortality are the only factors affecting demographic change and age structure, the level of population ageing in rural areas should have lagged behind that in urban areas.

However, internal migration in China militates against the dual impacts of fertility and mortality on age structure. The huge absolute number, and regional variation in rural-urban migration, means that the evolving demographic conditions that shape age structure are likely to affect different regions at different times. Most rural-urban migrants are young adults. In the migrant-receiving regions, which are normally more

[35] They are Shanghai (18.48%), Tianjin (13.75%), Jiangsu (13.75%), Beijing (13.66%), Zhejiang (13.18%), Chongqing (12.84%), Liaoning (12.59%), Shandong (12.31%), Sichuan (11.59%), Hunan (11.51%) and Anhui (11.18%).

[36] The health score is calculated on a scale of 0 to 100, where a score of 0 = complete difficulty functioning in day-to-day activities and 100 = no difficulty.

urbanised and industrial, such as Shanghai and Guangdong, residents with a residential permit elsewhere, who are usually migrants, are estimated to account for 20 to 30 per cent of population in these provinces in 2003 (Wang & Mason, 2008). Consequently, the proportion of older population is higher in rural areas than in urban areas. This difference is likely to increase as the rate of migration continues to rise.

3.2.3 Functional disability

Finally, China has a high proportion of older persons with functional disability. Functionally disabled older people are those aged 60 and over who need help with one or more activities involved with daily living (ADLs). Generally, ADLs include eating, dressing, bathing, toileting, transferring and continence. Depending on whether an older individual only has difficulty in, or totally cannot self–manage, one or more ADLs, functional disability could be distinguished as partial disability and total disability. According to a China National Committee on Ageing report (2011b), the number of partially and totally disabled older persons went up to 33 million by the end of 2010, accounting for 19% of the total older population in China. Moreover, the report shows that 32.8% of the functionally disabled older individuals are totally disabled, i.e. cannot manage one or more ADLs. With respect to urban-rural distinctions, rural areas have a higher proportion of totally disabled older persons than urban areas. Moreover, massive rural to urban migration has weakened Children’s capacity of offering in-kind support to old parents in rural areas. The data used in this thesis also show that urban older people are in general healthier than rural older people (see section 7.1.1). The variables of difficulty in ADL are included in multivariate analyses in chapter 6 and chapter 7 to control for the health effect on co-residence and intergenerational transfers.

3.3 National responses in China

The issue of rapidly expanding numbers of older people has given rise to widespread concern and the attention of the Chinese government since the late 1970s, when a large number of cadres from government institutions, staff and workers from state-owned-enterprise, began to retire annually[37] (Zhang & Guo, 2009). To solve problems associated with population ageing, China has learnt from the international community. Chinese delegates attended the first World Assembly on Ageing held in Vienna in July, 1982 and support the *Vienna International Plan of Action on Ageing* aiming to protect and promote rights and interests of older people. In October 1982, the China National Committee on Ageing (CNCA) was established with specified tasks to "conduct researches into the development strategies, policies and plans of the nation-wide work on ageing, and work out the methods of implementation".

To promote people's interest in the aged, and with a view to bringing about a debate on the ageing issue nationally, delegates from the State Council and 28 local provinces/municipalities attended the first *National Working Meeting on Ageing*[38] held in Beijing on 17-23 August, 1984, and agreed on the long-term goal of "five have while old"[39] for old age in China. Chinese policy-makers have also consulted academics about how to draw up policies aimed at dealing with ageing issues. The first China Gerontology Conference was held in 1986, during when the Gerontological Society of China (GSC) was founded. The ageing issue in China, however, is multidisciplinary in nature, involving social, economic, political, cultural and many other areas. With its aim of

[37] The People's Republic of China was established in 1949. An individual who worked in a government institute or state-owned enterprise would be aged 60 in 1979 if he/she was 30 years old in 1949.
[38] 全国老龄工作会议.
[39] The "five have while old" (五个老有) means people in China should have support, medical treatment, a sense of worthiness, life-long learning opportunity and entertainment while old (老有所养、老有所医、老有所为、老有所学、老有所乐).

understanding and provide solutions to ageing issues, the state established the China Research Centre on Ageing (CRCA) in 1988 with the approval of the State Council of China. The CRCA is a national research institution affiliated to CNCA which undertakes multidisciplinary research on ageing, conducts national surveys and field work, and provides solutions to policy-makers.

In December 1994, ten departments[40] jointly issued the *Outline of Seven-Year Development Program for China's Old-Age Work* (1994-2000)[41], which stipulates that local governments should put ageing issues high on the agenda and protect the rights and interests of older persons. The Agenda proposes to establish a well-functioning social security system covering urban and rural areas. However, there was no legal protection of older people's rights and interests in China until the approval of the *Law of the People's Republic of China on Protection of the Rights and Interests of the Elderly* in 1996. This is the first law that aims to protect the rights and interests of older persons in China, and to provide a legal framework concerning the aged.

Coping with an ageing population involves dealing with multi-dimensional issues, and effective policies require collaboration between different agencies. The China National Working Commission on Ageing (CNWCA) was founded in 1999 with the task of "coordinating and facilitating relevant departments to strengthen macro-level guidance and comprehensive management of the work on ageing" (CNWCA website[42]). Vice Premier Li Nanqing[43], who was also a member of the Standing Committee of the Political Bureau of the Central Committee at that time, was appointed as the first director of

[40] The ten departments are the State Planning Commission, Ministry of Civil Affairs, Ministry of Labour, Ministry of Personnel, Ministry of Health, Ministry of Finance, State Education Commission, All-China Federation of Trade Unions, All-China Women's Federation and the China National Committee on Ageing.
[41] 《中国老龄工作七年发展纲要（1994－2000年）》.
[42] See: http://en.cncaprc.gov.cn/en/index.html.
[43] The current director of CNWCA is Vice Premier Hui Liangyu.

CNWCA[44], signalling that the party and government were paying more attention to the ageing issue than previously.

The State Council of China announced *The Outline of Work for The Aged in China During The 10th Five-year Plan Period (2001 - 2005)*[45] in 2001, stating that the goal of the state during the period 2001 to 2005 is to carry out the "five have while old" programme, and improve the living standards of older people, to establish initial social security systems with different characteristics for urban and rural residents, to establish a city-community-based support system for older persons, and to protect the rights and interests of the aged (The State Council of China, 2001).

Rather than simply focusing exclusively on promoting economic growth, the Chinese government has become concerned, in recent years, with social issues. The 30-year economic reform has not only achieved a dramatic rise in income levels, but has also created a growing income gap between the rich and the poor and an inadequate social security system. The unequal opportunity to benefit from economic growth has worsened social tensions, and threatened the party's stability. The Madrid International Plan of Action on Ageing, which was adopted in the Second World Assembly on Ageing in 2002, is generally recognised as widely influencing both the debate on intergenerational solidarity in China, and the Chinese government's policies “to respond to the opportunities and challenges of population ageing in the twenty-first century and to promote the development of a society for all ages”[46]. In October 2006, President Hu Jintao laid out a political doctrine during the 4th Plenary Session of the 10th National Committee of the Chinese People's Political Consultative Conference that calls for a "harmonious society" (Fan, 2006). One of the main goals of building such a harmonious

[44] The Committee of CNWCA is composed of 23 departments including, Ministry of Civil Affairs, Ministry of Education, Ministry of Labour, Ministry of Culture, Ministry of Health, Ministry of Finance, State Planning Commission and so on.

[45] 《中国老龄事业发展“十五”计划纲要 (2001—2005年)》.

[46] Political Declaration of the Second World Assembly on Ageing, 2002, article 1.

society is to narrow the gap between urban and rural populations, and between regions and age groups. Without improving the intergenerational solidarity and equality, and allowing the benefits of economic growth to be shared, it is unlikely that China will be able to build such a harmonious society with sustainable prosperity.

3.4 Discussion and conclusion

I have outlined some of the characteristics of China's demographic transitions in this chapter. China is entering a new historical era that has population ageing as its primary demographic characteristic. Demographic transition, and population ageing, have intensified in China in recent decades. China is experiencing substantial changes in the age structure of its populations as a result of the transition from high to low levels of fertility and mortality. These changes consist of a sharp drop in the share of the child population, and important increases in the proportion of the adult population, and particularly the older population. China's age structure has shifted from being a young and growing population to an old and declining one, and is expected to have an enlarged proportion of older people over time. As the growth of the older population is much faster than that of the total population, population ageing in China is likely to continue. The old-age dependency ratio has been growing, and will increase at an increasing rate until the mid-2050s.

It is generally agreed that most rapidly ageing societies are likely to face the conflict-generating issues related to social and economic development that have emerged in Europe and North America. As population ageing in developing countries is more rapid than in developed countries, the former will have less time and resources than the latter to adapt to the consequences of population ageing. Whereas developed countries grew rich before they grew old, the fact that China is ageing before it becomes a modernised and rich country presents serious challenges, one of the most direct and important of which relates to support for older people.

Despite China's significant progress in the past three decades in solving problems associated with an ageing demographic, it still faces tremendous challenges, and the debate is likely to continue on both its traditional family-based support system, and reform of the pension system (Calvo & Williamson, 2008; Ikels, 2006). The economic resources of older persons normally have three sources: personal income and saving; financial support and assistance of family members (e.g. children, siblings); and pension or retirement income. However, currently, older Chinese people generally have not accumulated sufficient wealth to support their life in old age, leaving family members and the state as the main pillars of financial support for them. Moreover, because of the mass layoff programme within state-owned enterprises, many workers are forced or encouraged to retire before the legal retirement age. As a result, a low legal retirement age regulation, actual premature retirement, and an increasing old-age dependency ratio, have greatly increased the burden on society and families in supporting older people.

China is building up a functioning pension system that covers all old-age residents. However, China's pension system is criticised for its low coverage rate, fragmentation and lack of financial sustainability. The following chapter will introduce the pension system in China, including the main challenges facing the development of the system.

Appendix 3.1: *Exchange rates used in text (year-end), Yuan per US $1.00*

1990 – 1991	5.40 Yuan
1995 – 2003	8.28 Yuan
2004	8.23 Yuan
2005	8.07 Yuan
2006	7.81 Yuan
2007	7.31 Yuan
2008	6.83 Yuan
2009	6.82 Yuan
2010	6.62 Yuan
2011	6.30 Yuan

Source: Bank of China

Chapter 4: The development of an old-age social security system in China

With the rapidly increasing number of older people, the demand for old-age financial support is growing. However, the demographic transition that is characterised by population ageing, places not only traditional family-based support mechanisms but also the public pension system under increasing pressure. China is reforming its pension system, shifting from the initial intra-firm pension model to a functioning social insurance system that covers all the population. The term “pension reform” usually refers to retrenchment or substantial cuts in government spending on pensions, which is particularly true in today’s Europe. But in the case of China, a series of reforms have resulted in a rapid increase in pension expenditure as well as liability. Pension reforms during the 1990s brought about rapid increases in pension distribution and collection in China through new channels, but the reforms left many areas unchanged. For example, mandatory retirement ages, set in 1951, continue to be 60 for men, 50 for women employees and 55 for women cadres. Moreover, the pension scheme for government and public institution staff is separate from the pension scheme for the rest of population, as it was in 1978, and continues to be financed directly by government budget rather than contributions from employers and employees. The problem of empty accounts (see below) has not been solved. Instead, local governments regularly “borrow” the money from the individual accounts of those of working age in order to pay benefits to current retirees.

In the process of constructing its public pension system, China has adopted an urban-priority reform approach (Wang, 2006). It is generally acknowledged by scholars that the uneven urban-rural development model, sometimes called the dual economic model, has generated a vast gap in income level, living standards, educational systems, social insurance and public health services between urban and rural areas, which has made China “two different nations” (Dixon, 1981; Frazier, 2010; Knight, Song *et al.*, 1999; Shi, 2006; Wang, 2006). The initial pension scenario was set up during the planned economy period (1952-1979), in which eligibility was based on employment and on residency. This pre-reform social security system provided full-time workers in state-owned enterprises (hereafter referred to as SOEs) with the most generous benefits (the *iron rice bowl*), including basic pension, housing, health care and other services, while urban residents without such employment ties to SOEs received much fewer welfare benefits. By contrast, rural residents had very limited access to the welfare programme and had to rely on land and family as the source of old-age support (Shi, 2006). Today, although there are many linkages between the urban and rural pension schemes, the two systems are not likely to converge in decades ahead but to co-exist for quite some time. Therefore, I decide to keep them apart for analysis.

The aim of this chapter is to provide the background of China’s pension system. It briefly reviews the development of the system, and addresses the main challenges in the process of constructing a financially sustainable old age security system. The description of pension development in urban China is relatively long because some of the details (the Liaoning, Heilongjiang and Jilin pilot projects) will be used in chapter 7 to support the validity of instrument variables. This chapter is organised as follows: section 4.1 and 4.2 will briefly describe the development of pension systems and pension policies in urban and rural areas, respectively; then section 4.3 will present the achievements and challenges of the current pension system; finally section 4.4 will conclude.

4.1 Pension development in urban China

The 1951 Labour Insurance Regulations of the People's Republic of China[47] is the path-breaking policy statement issued by the central government which stipulates broad policies on the issue of pension, as well as other forms of social insurance. Policies after 1951 mainly aimed at broadening coverage and clarifying policies to standardise implementation remained in place until 1966. However, during the period of the Cultural Revolution (1966-1976) China's pension system disintegrated in the face of domestic turmoil and effectively ceased to operate. In 1978, the year usually recognised as the beginning of the economic reform, the State Council announced the Temporary Regulations on Retirement and Resignation of Workers and the Temporary Regulations on Arrangements for Old, Frail, Ailing and Disabled Cadres[48]. The 1978 Regulations provided generous pensions (as well as housing and medical care) with replacement rates ranging from 60 to 75 per cent based on the length of participation, and reaffirmed the retirement age – 60 for men and 55 for women. However, the unified pension system was segregated into two models, with different regulations for officers in government institutes and for employees in enterprises. There have not been significant changes in regulations regarding pensions for government institution staff since then. Consequently, unless stated, the following discussion on pension reform refers to pensions for citizens excluding the staff of government institutions.

To the extent that pension provision tended to take the form of schemes operating at the level of the individual enterprise, China's pension system during this period can best be described as having displayed obvious intra-firm welfare characteristics. Pension reforms after 1978 mainly aimed at re-establishing the national pension system, i.e. converting the intra-firm pension system into a social insurance system[49]. There were a

[47] English version available at: http://www.novexcn.com/labor_insur_regs_51.html.
[48] Available at: http://www.haldbz.gov.cn/0310/632.htm.
[49] The first move was made in 1984, beginning with an experiment in five cities (Dongguan and Jiangmen in Guangdong province, Zigong in Sichuan province, Taizhou in Jiangsu province and Heishang county in

series of pension regulations[50] issued during the 1980s and the mid-1990s on the basis of experiments of pooling pension funds at different administrative levels, including extending the coverage from SOEs to other enterprises, and enlarging the pooling base from city to provincial level. The Decision on Issues of Establishing a Socialist Market Economy System was approved in 1993, proposing the principle of "integrating social pools and individual accounts" (Chapter 5, Article 27). The statement proposed that future urban pension benefits should be drawn from both pooling funds and mandatory individual accounts. It proposed that social pools and individual accounts should be managed by the same organisation. However, this statement gave local authorities a crucial loophole to integrate individual accounts and social pools by using money from both of these funds to deliver pension benefits to current retirees.

Although high-ranking policymakers had reached a consensus that the pension scheme should comprise a combination of social pool and individual accounts, they had different understandings of how to combine them and in what proportion. The State Council issued The Announcement of Deepening Old Age Insurance System Reform for Enterprise Staff and Workers in 1995 which clearly stipulated the target of establishing a combination of social pooling and individual accounts by 2000. The 1995 Announcement proposed two different scenarios as a means to achieve such a unified insurance system, from which local authorities could choose or make any combination, according to their economic circumstances. Both choices involve social pooling and individual accounts, with plan A based on the model of "large social pooling, small

Liaoning province). Such experiments were carried out in several provinces, of which the core was to set up a local pool of operating funds across SOEs at county or municipal level managed by the newly established Social Insurance Agencies (SIA) and financed by participating SOEs. If the pension contributions of an SOE exceeded the costs, the difference was remitted to the pool. If the pension costs were higher, the pool would cover the shortage.

[50] For example, in 1991, the State Council announced The Decision on the Reform of the Enterprise Pension System to seek to establish a multi-pillar pension system by introducing a new calculation of pension benefits based on a combination of three sources to replace the previous calculation of pension benefits as a fixed percentage of pre-retirement wages.

individual accounts" and plan B based on the model of "large individual accounts, small social pooling". The original idea of such choices was to compare and contrast the advantages and disadvantages of both models and find a balance of social pooling and individual accounts to improve the efficiency of pension insurance. Nevertheless, the 1995 Announcement "has opened up the Pandora's box" (World Bank, 1997, p. 17) and led to further fragmentation of the pension system.

In 1997, the State Council announced The Decision on Establishment of a Unified Basic Pension Insurance System for Enterprise Employees, outlining a unified nationwide pension scheme to replace all pilot programmes. The 1997 Decision supported the idea of a three-pillar pension system, consisting of a mandatory social pooling account, a mandatory individual account and a voluntary supplementary individual account. Moreover, in theory at least, it brought unity to the pension scheme by constraining local authorities to adopt the same standard of contribution rate. The social pool works on a PAYG basis, and is financed by employers' (in other words enterprises') contributions. Provincial authorities are given the powers to set the contribution rate, up to a maximum of 20% of the enterprise's total wages. The pooling account is designed to redistribute to all beneficiaries. The 1997 Decision also called for the gradual expansion of pension coverage to all urban workers including the self-employed, and compelled local authorities to follow certain parameters in calculating revenues and benefits.

Pension reforms introduced in the late 1990s mainly focused on perfecting the basic pension scheme for urban employees, enlarging the social pools, and expanding pension insurance coverage. Yet, the new pension system faced significant funding challenges. The reform became bogged down by the preoccupation with resolving the "legacy costs" associated with the transition from the old system that prevailed before 1997, and by some aspects of the revised system. The legacy costs generally refer to the difference in pension entitlements for transition generations between the revised and the old systems and come from both social pool and individual accounts. On the one hand, because the old system was not funded, and the contribution rates in the revised system's social pension were designed with a view to a lower replacement rate than the old system, as a result the current contribution rate from people of working age to the pension pool is lower than the replacement rate paid to those retired before 1997. The transition costs represent an unfunded liability in the social pool. On the other hand, both "old men" and "middle men"[51] did not accumulate in individual accounts, generating huge pension deficits.

Another financial difficulty resulting from both decentralised administration and legacy costs is the general existence of empty accounts. Empty accounts result from regular "borrowing" by local governments of individual account contributions by working age people to finance deficits in social pools paying current pensioners[52]. To solve the problem of empty individual accounts, the State Council announced the Pilot Programme for Improving the Urban Social Security System in 2000 to ensure individual accounts are actually funded, on an experimental basis in Liaoning province[53] and selected cities in some other provinces.

The Liaoning pilot project sought to create fully funded individual accounts by separating the administration of social pooling accounts and individual accounts, and making contributions into individual pension accounts the responsibility solely of

[51] According to the 1997 Decision, those who retired before 1997 are called "old men", and are entitled to the original PAYG system; those who entered the labour market in or after 1997 (the so called "new men") are entitled to the new pension scheme; finally those who retire in 1997 or later but who entered the labour market before 1997 (the so called "middle men") are entitled to the new pension scheme benefits and an additional "transition pension" to compensate them for the years during which they did not contribute to their individual accounts.

[52] Local governments are able to do so because contributions to both social pool and individual accounts are deposited in the same government bank accounts and under management by the same authority.

[53] Liaoning had a high proportion of SOE workers and consequently the burden of laid-off SOE employees was particularly large. In 2004, Liaoning had only 3.2% of the total Chinese population, but 7.2% of all SOE retirees (Wang 2006).

individuals. The contribution rate into individual accounts was adjusted from 11% (including 3% from enterprises and 8% from individuals) to 8% of wages from individuals. The central government provided subsidies to cover current shortfalls in pension benefits paid to retirees,[54] as well as cash to fund individual accounts. Of the contribution of 8% of individuals' wages, 5% is financed by both the central government (75%) and Liaoning provincial government (25%); the other 3% is funded by collection of premiums. Fully funded individual account funds are deposited in the state banks and managed by the provincial SIA.

The pilot project in Liaoning, which was initiated in 2001, was then expanded to include Heilongjiang and Jilin[55] provinces in 2004, with some modifications. Actually, there have been different opinions concerning which deficits should be subsidised by central government since the beginning of the decision to fully fund empty accounts. Because it is the shortfall in current pension benefits resulting from legacy costs which generated empty accounts, the first policy is to subsidise such basic pension deficits directly, which is what the Liaoning model did. Alternatively, local governments could "borrow" money from individual accounts to pay for pension benefits, leaving the empty accounts to be financed by central government subsidy later on (Su & Yang, 2007). The Heilongjiang-Jilin model follows the latter policy that individual account funds were not transferred to the provincial-level pool (but stayed in the city/county-level pool) and were used by local governments (cities or counties) to finance current pension deficits. The subsidy from central government is transferred into the provincial government's bank accounts to match empty accounts. Therefore, the Heilongjiang-Jilin model actually does

[54] If the subsidies are not enough to cover pension benefit deficits, local governments have to raise their own funds.

[55] The three provinces in northeast China had at least one similarity in terms of the pension issue: large numbers of laid-off workers and enormous pension liabilities. An ACFTU statistics (2002, 90) shows that, of the 43,617 enterprises that owned unpaid pensions to retirees by 2000, 21.7% were located in these three provinces.

not fully fund the empty individual accounts, but sets up a provincial pool to match city/county-level empty accounts and to support future payment of individual accounts.

In 2005, the State Council issued the Decision on Improving the Basic Pension Insurance System for Enterprise Employees based on experiences drawn from the pilot projects. The 2005 Decision revises the pension policies set up by the 1997 Decision, and ties pension benefits to workers' contributions. It stipulates an employee who reaches retirement age after contributing for 15 years will receive a monthly pension at the replacement rate of 15% of the average local wage in the social pooling account. Besides, a participant will receive a pension with 1 more percentage of replacement rate if he or she contributes for one more year after the obligatory 15 years' contribution[56]. At a national level, however, the contribution of individual accounts is reduced from 11% to 8% and solely contributed by individuals. Moreover, the 2005 Decision expands the basic pension coverage to include all non-public enterprise employees, self-employed workers and non-contract employees in urban areas.

Pension reform in the late 2000s has focused on rural pension schemes, which will be discussed in the next section. By the end of 2010, the only people to be excluded from the framework of the pension system were non-working urban residents. To fill the gap, the State Council introduced an experimental social pension system for urban residents in 2011. The design of the social pension scheme is similar to the new rural pension scheme, consisting of a voluntary individual account financed by participants' contributions and local government subsidy, plus a flat-rate basic component of 55 *Yuan* per month financed by the central government. The only difference is that urban residents can choose a monthly contribution of between 100 and 1000 *Yuan*.

[56] For example, if an individual started working at the age of 20 and retired at 60, according to Document 38, he or she will receive monthly pension benefits of 40% of the average local wage in a social pooling account, as well as benefits in the individual account.

4.2 Pension system in rural China

The introduction of land reform, and the establishment of the People's Commune in the late 1950s, turned land and other means of production in rural areas into a collectively owned resource. The residential registration system (*hukou*) restricts rural residents from migrating freely to cities, and excludes them from the urban welfare system. Prior to the pension reform, old-age security in rural China was provided primarily by the family, together with a minimal element of collective support[57]. China introduced the first pilot project of insurance for older people in some relatively well-off rural regions in the late 1980s. China promulgated a programme[58] in 1992 to establish the underlying principles for the pension system in rural areas.

The 1992 Programme actually allowed governments at county level to establish local pension schemes for rural residents. Such pension schemes consisted only of individual accounts, and had motivated peasants to take part, and were supported by the central government which aimed to roll it out nationwide. However, after the 1997 Asian financial crisis, China started overhauling its financial system as well as its rural social insurance system. Because interest rates fell after the financial crisis, it created difficulty and risk in paying the promised interest of individual account funds. As a result, most local governments experienced a dramatic decrease in participation rates for rural insurance, and faced a dilemma in administrating individual account funds. The development of the rural pension system became bogged down after 1998. The government cut down the existing businesses, stopped accepting new businesses, and stopped the state subsidies of the pension scheme in rural areas. As the system required

[57] The collectives played a residual role in providing food, clothing, medical care, housing and burial expenses (the so called *Five Guarantees*, or *wubao* in Chinese) in order to secure the livelihood of childless and disabled older persons.

[58] The Basic Programme for Rural Social Security Insurance.

contributions only from farmers, many of whom had finally quit due to a lack of money, the newly established rural pension system failed almost entirely. For a relatively long time, older people in rural China have had to rely heavily on land and family.

In September 2009, the State Council issued a plan, which is voluntary in nature, to establish and improve the rural pension system. This so called new rural social pension insurance programme (*xinnongbao*) started with a trial covering at least 10 per cent of rural older people, with an expected second step which will cover approximately 50 per cent by 2012 and with an eventual target of 100 per cent by 2020 (China News, 2009). It consists of two components: an individual account component based on contributions from participants, and a basic pension component financed by central and local government (and collectives in relatively developed regions). Participants can choose to pay between 100 and 500 *Yuan* annually (100, 200, 300, 400 or 500) in contributions to their individual accounts. The local government will contribute a minimum of 30 *Yuan* per month to participants' individual accounts. When a participant reaches the age of 60, he or she will receive a monthly pension benefit (from local government) calculated as the sum of accumulated amounts from the individual account divided by 139, plus a flat-rate pension of 55 *Yuan* from the basic account per month. Such flat-rate pension benefits are financed by the central government (50 per cent), and local governments in economically developed provinces, and are fully financed by central government in all other regions.

Although, as revealed by the State Council, the benefits will be relatively modest, the new rural pension scheme sees, for the first time in China's long history, the government making a direct contribution to a rural pension scheme. The new rural pension insurance programme will have significant implications, not only for the massive ageing population in rural areas, but also for economic and societal development in rural

China more generally. However, the entitlement to pension benefits is conditional. The plan stipulates that in order to qualify for the basic account, participants' children must take part in the new rural pension scheme, and contribute to their individual accounts. Additionally, those who will begin to receive benefits in less than 15 years, will be required to contribute to their individual accounts until they reach the age of 60; those who will receive benefits in more than 15 years must contribute to individual accounts for at least 15 years.

The new rural pension insurance programme is developing much more rapidly than was initially planned in 2009. According to a news report (Xinhua News, 2012a), by the end of 2011, 2147 counties in all 27 provinces, and four municipalities, had implemented the new rural pension scheme, with 358 million peasants participating, and 98.8 million rural older people having received a monthly pension under the scheme, accounting for more than 60 per cent of the older population in rural areas.

4.3 Challenges of the old-age security system

The current multi-pillar old age security system in China has been criticised and challenged for its multi-level fragmentations. Broadly, it is fragmented into three separate pension schemes: an urban pension scheme, a rural pension scheme, and a government employees' (including employees of state and party organisations, and employees of public service units) pension scheme. The pension scheme for government employees has not changed since 1978, when it was separated from the enterprise employee pension scheme. As a result, the replacement rate has not declined in the same way as that for enterprise employees (Table 4.1). Such pension schemes are non-contributory, and are financed directly by the government (central or local government, or sometimes both) to which the institution concerned is affiliated. Pension funds are managed independently by the designated agencies or departments in each institution. Moreover, it provides much better pension benefits than the enterprise employee pension scheme. In 2005, for example, the annual per capita pension expenditure for employees of government organisations and public service units was 18,410 *Yuan* (US$2,281) and 16,425 *Yuan* (US$2,035) respectively, while the pension expenditure for enterprise employees is 8,803 *Yuan* (US$1,091). Furthermore, the pension benefits for retired public servants are linked to the growth in current wages of public servants[59], resulting in a growing gap in pension benefits between government and public institution employees on the one hand, and enterprise employees (Table 4.1). This has been challenged as being an unfair aspect of China's pension system.

Table 4.1: *Replacement rates of pension benefit by working units, 1998–2005*

Year	Enterprises	Public Service Units	Government Organs
1998	73.7	98.3	101.7
1999	72.6	100.1	100.4
2000	68.8	106.0	100.0
2001	65.0	100.2	99.0
2002	64.3	93.9	98.2
2003	58.6	96.7	97.4
2004	51.9	90.4	92.5
2005	49.3	87.7	88.4

Sources: Calculated from the China Labour Statistics Yearbook 1998-2005
Notes: (1) Displayed as percentage.
(2) From 2006 onward, neither the China Labour Statistics Yearbook nor the Statistics Yearbook of China report pension expenditures by working units.

Recently, in May 2012, the State Council approved the Twelfth Five-year Plan for Social Security (2012–2017), which calls for pension reform for government employees (The State Council of China, 2012). However, neither detailed regulations nor a clear timetable have been provided. Although several pilot projects had been proposed, designed to integrate the government employee scheme and the enterprise employee

59 The growth rate of pension benefits for government employees is set to be the same as the growth rate of current government employees' wages.

scheme in many provinces, the government finds it is difficult to achieve such goals. For example, the Guangdong government proposed the Implementation Guidelines on Wage Reform of Public Service Units in Guangdong Province by Categories (A Draft for Discussing) at the end of 2008, calling for an “old system for old men, a new system for new men” pension reform strategy for public service unit employees. While the government had promised that such reform would not have an adverse impact on existing employees, details of the supplementary pension system required to achieve this goal were never unveiled. As a consequence, such a proposal has caused massive early retirement, and requests from those who had been transferred from government organisations to public service units to be allowed to revert to previous civil servant status, and there have even been signed letters submitted to the central government expressing opposition to such reform. Given that adverse employee reactions may lead to political instability, the Guangdong government has decided not to introduce the reform project until a later, unspecified, date (Wang & Qiao, 2011).

The current pension scheme is also fragmented geographically, with regulations and implementation varying across provinces. The central government sets national guidelines that are implemented locally. Provincial, or more often county/township level authorities, have substantial discretion about who is to be included in the system (coverage rate), and the contribution and replacement rate. For example, Document No. 32 stipulates that children of pensioners in rural areas must participate in the new rural pension insurance scheme in order to allow their parents to be entitled to the monthly 55 *Yuan* basic pension benefit. In practice, local authorities have different criteria for receiving basic pension benefit. In some regions, older people are entitled to basic pension benefits if their “own child or children working in the same city/county participate in the rural insurance scheme”, while in other regions basic pension recipients must have “all children including son- or daughter-in-law participate in the system” (Yang, 2011).

System fragmentation has made it harder for China to finance current pension expenditures, because the system in operation lacks economies of scale. While pension systems in many societies function at a national level, allowing for a broad pooling of risks across sub-national regions, local authorities in China with surpluses prefer to reduce the contribution rates or invest the surpluses, rather than to pool their schemes with other regions. The Ministry of Human Resources and Social Security (MOHRSS) has encouraged provincial authorities to set up provincial pooling to share pension revenue and expenditure since 2007. However, even Mr Yin Weimin, the minister of MOHRSS, acknowledges that “all provinces have formulated regulations of provincial pooling, but implementation of such regulations needs to be evaluated” (China News, 2012). Herd, Hu *et al.* (2010) estimate the proportion of contributors covered by provincial pooling to have been 38 per cent in 2008. In addition, even in areas which achieved provincial level pooling, pension funds are managed by lower tiers of governments, while provincial governments are able to shift surpluses to finance deficits in other regions.

The difficulty of building up national - or even provincial - level pooling arises primarily from universal regional economic and demographic disparity in China. To maximise their own utility, regions with advanced social welfare systems or younger population age structures will have less or no incentive to be integrated into a high level, because in such circumstances pension benefit would be averaged to a lower level. Secondly, pension funds and their revenues have become a significantly important resource and income for local governments, who then have little incentive to give up the power of management. Thirdly, an enforcement of pooling pension funds at national level would lead to huge levels of liabilities to be inherited and financed by the central government. As a result, surpluses in some regions have often not been used to finance shortfalls in other regions, which in turn either the central government has had to finance or local authorities have to "borrow" from individual accounts.

Reforming the pension system, which requires contributions from enterprises, individuals and subsidies from central and local governments, faces significant challenges in terms of funding[60]. The high contribution rate (around 28% of wages) has resulted in low compliance and a vicious circle of insufficient pension funding. Another reason for low compliance was the lack of a national social security law until July 2011 (The State Council of China, 2010), which raises the difficulty of inflicting sufficient penalties on non-compliant employers. Many employers, particularly those of private firms, tend to take steps to avoid paying contributions. Moreover, newly founded enterprises are often coerced into deciding which employees to include in the security net, or to declare staff as having self-employment status, in which case a lower contribution rate will be paid. An early study (Cai, Giles *et al.*, 2006) based on a 14-city survey shows that only 41 per cent of employees from private enterprises report that they and their employers are participating in the social security programmes.

Low compliance also results from the lack of public trust of the system, due to unclear rules and suspicion that contributions might be used for expenditures other than those for which they are intended. Corruption and misuse of pension funds does happen from time to time, and usually involves huge amounts of money. For example, the Shanghai pension fund scandal[61] in 2006, and the Guangzhou pension fund scandal in

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[60] An early study (Holland, 2002) estimates a shortfall of roughly 3.7 trillion *Yuan* (451 billion US dollars) over the next three decades.

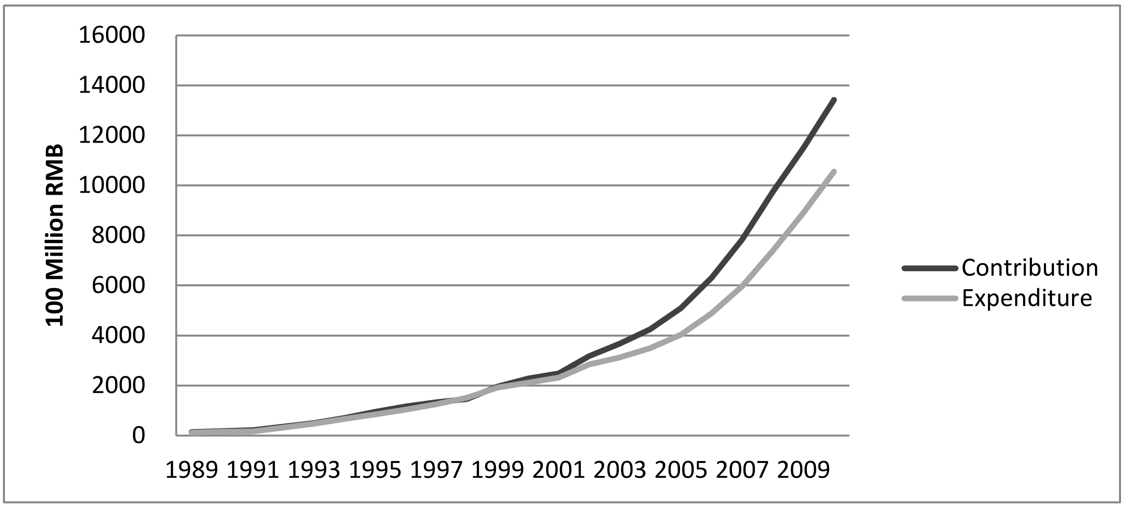
[61] In August 2006 investigators discovered that the Shanghai Social Security Fund had invested a large share (approximately one third) of its 10 billion *Yuan* (US$1.25 billion) social security fund in highly speculative real estate projects. This is clearly not in line with the investment guidelines of the State

2007, involved some 3 billion *Yuan* (US$420 million) and 750 million *Yuan* (US$100 million), respectively, from the social security fund being invested in "risky" businesses. This has contributed to lowering participation rates and compliance of individual accounts.

Finally, the deep-rooted historical problem of empty accounts, which restricted pension reform, has not been solved, and will challenge the financial sustainability of China's pension system. Ten years after its implementation, the Liaoning pilot project of funding individual accounts ended in failure. According to Hu Xiaoyi, the vice Minister of MOHRSS, the State Council has approved the request by Liaoning government to "borrow" money from individual accounts to pay for current pension benefits (Xinhua News, 2012b). The main reason is that as the urban basic pension coverage broadens, especially with the inclusion of "middle-aged men" and "old men" (employees retired before 1997 or who entered the labour market before 1997 and will retire after 1997, who have not or have partially contributed in their individual accounts), pension expenditure to pay for current retirees and to fund empty individual accounts increases dramatically. However, an annual flat-rate subsidy of 1.44 billion *Yuan* (equivalent to 3.75% of empty accounts in Liaoning in 2001) from the central government does not adjust the pension coverage rate and expenditure, leaving the increasing financial burden on the shoulders of local governments. In my example, excluding central government's subsidy, Liaoning was into a pension deficit of 14.65 billion *Yuan* in 2010 (Zheng, 2011). To fully fund empty individual accounts, China needs roughly another 1.7 trillion *Yuan* (US$269.5 billion) in 2010 and more in the future (East Daily, 2012).

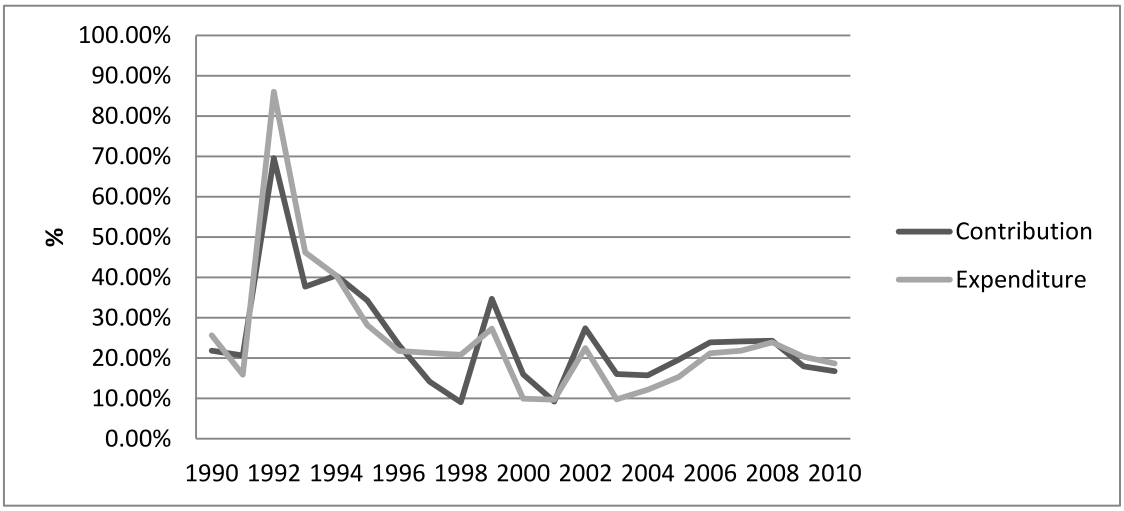
Council and it has been assumed that officials have personally benefited from these transfers (BBC News, 23 October 2006).

Figure 4.1: *Absolute number of urban basic pension contributions and expenditures*



Source: NBSC 2011

Figure 4.2: *Annual growth rate of urban basic pension contributions and expenditures*



Source: NBSC 2011

China's pension system may require current and future transfers from the budget of the central and local governments into the social security funds. Generally, the rapid growth of old age dependency ratio, resulting from demographic trends, is likely to reshape the balance of pension contributors and recipients (and pension contributions and expenditures), leading to an increasing proportion of the latter. More specifically, on the one hand, the new rural pension insurance scheme is set up as being subsidised by the central government and partly by economically developed provinces, which would undoubtedly involve an increasing deficit. On the other hand, the urban pension scheme may not be financially sustainable on its own, because of huge deficits inherited from the old pension system and low returns on investments of social security funds (Chen, 2005). Although pension contributions have exceeded expenditure in absolute terms, statistics show that pension expenditure has been growing faster than pension contributions since 2009 (Figure 4.1 and 4.2). By 2010, the total contributions of the urban enterprise employee pension scheme was 1,342 billion *Yuan* (an annual growth rate of 16.8%), while expenditure was 1,056 billion *Yuan* (an annual growth rate of 18.7%), involving subsidies from central and local governments of 195 billion *Yuan* (0.48% of GDP) (MOHRSS, 2011). Moreover, one has to bear in mind that the urban basic pension contribution, which includes funds in pooling accounts and individual accounts, is nominal only, because it involves a said 1.7 trillion *Yuan* debt from empty individual accounts.

Although it is difficult to model China's pension system given that detailed information on the structure of the labour force, contributors and pensions is not publicly available, scholarly works on pension projections may show reliable hints on the financial sustainability of China's pension system. Oksanen (2010) projects the urban enterprise employee pension scheme will go into deficit after 2025 and its debts will increase to 2% of GDP in 2050 (assuming a constant contribution rate of 28% of wages, unchanged retirement age for men, a slight increase in retirement age for women, and an unchanged coverage rate). Oksanen also makes projections for the rural pension scheme, which suggests debts equivalent to 0.5% of GDP by 2025 or equivalent to 1.2% of GDP by 2050 when full coverage is achieved. An OECD study (Herd, Hu *et al.*, 2010) predicts a worst-case scenario for China's pension deficits. Assuming an unchanged retirement age and demographic trend, this study projects that the urban enterprise employee pension scheme will emerge with a deficit by the end of the 2010s, and such pension debits will increase to 5% of GDP by 2050. Another recent study (Zeng, 2011) projects that China's pension system will confront deficits equivalent to 11.5% of total wages in 2020 and 26.9% of total wages in 2050, based on the assumption of an unchanged fertility policy, retirement age and medium-mortality variant. Therefore, even assuming unchanged pension coverage rates, China's pension liability from its urban enterprise employee pension scheme will take up about 2% - 5% of its GDP by 2050.

4.4 Discussion

The current Chinese pension system is the product of a long history of revisions and reforms, reflecting inconsistencies between central government announcements and actual implementation by local governments. China is reforming its pension system, and has shifted the administrative responsibilities for pensions from SOEs to local governments. In the context of rapid population ageing, a number of initiatives have been taken in recent years to reform the pension system. However, the current system is very fragmented, with different regimes for the government sector, urban and rural, as well as within each of them. Some of the recent reforms which aim to increase geographical pooling have been only partly implemented, while other reforms have served to complicate the existing fragmentation. The fragmentation of the pension system has raised many financial and societal issues.

China is still in the middle of the process of realising its aim of building a social security system with "high coverage rate, minimum guarantee, multi-layers and financial sustainability". Although China has set up a unified pension insurance system which theoretically includes the whole population, pension administration is left largely to local governments, and the actual coverage rate is low. Zheng and Lu (2011) estimated that only about half of retirees receive any form of pension, and about half of workers are covered by the current pension system. Moreover, the current system is not financially sustainable on its own, but would require either a significantly increased contribution rate, or an enlarged subsidy from government. Such financial difficulties mainly arise from four sources, and it is not likely that these problems can be solved in the short term. Firstly, the current urban pension system inherited a huge quantity of unfunded pension liabilities from the old system. Secondly, the new rural pension system has been set up to be subsidised partly by central government and partly by economically developed provinces, which undoubtedly involves a growing deficit. Thirdly, the fragmentation of the pension system makes it difficult to finance pension liabilities. Fourthly, the immaturity of capital markets means that it is difficult to invest pension funds in such a way as to secure a higher rate of return. Therefore, the provision of pension funds has been left largely to the Chinese government.

Table 4.2: *Pension expenditures and coverage rates in selected countries*

Country	Pension expenditures as percentage of GDP (%)	Percentage of formal-sector labour force covered (%)
Brazil	12.6 (2004)	52.6 (2004)
France	12.4 (2005)	89.9 (2005)
Japan	8.9 (2005)	95.3(2005)
US	6.0 (2005)	92.2 (2005)
UK	5.7 (2005)	93.2 (2005)
Russia	4.7 (2007)	67.0 (2007)
Canada	4.1 (2005)	66.9 (2007)
China	2.4 (2006)	19.3 (2007)
Costa Rica	2.4 (2004)	55.3 (2006)
India	2.2 (2007)	10.3 (2007)
S. Korea	1.6 (2005)	49.5 (2005)
Mexico	1.3 (2005)	30.3 (2008)
South Africa	1.2 (2006)	6.50 (2007)
Zambia	1.0 (2008)	10.9 (2006)
Nepal	0.2 (2006)	3.40 (2008)

Source: World Bank Development Indicators, 2011 (World Bank, 2011)

Pension coverage rates, and benefits, are unlikely to rise rapidly for a relatively long time. There could be social and political reasons for increasing pension coverage and benefits further. However, the reform strategy of “crossing the river by touching stones”, i.e. relying on experimentation in certain areas, and then adjusting policy guidelines on the basis of findings, will tend to diminish the speed of reform. Moreover, given that the estimated pension liability will be equivalent to 2% - 5% of GDP by 2050, China's real pension expenditure (nominal expenditures plus liabilities) will at least account for about 4.4% - 7.4% of its GDP. Such pension expenditure ratio of GDP will be close to those ratios in several developed countries such as Canada and the US in 2005 (Table 4.2). However, this prediction is conditional on the low coverage rate of the working force in China (e.g. 19.9% in 2007) compared to the coverage rates in these developed countries. As a developing country, China has limited economic resources to handle such issues, leaving limited space for increasing pension benefits nationally. Because even a 0.5% - 1.2% of GDP continuous expenditure flow cannot be persistently financed by issuing debt (Oksanen, 2010), increasing pension benefits rapidly would further undermine the credibility and sustainability of the system, unless China managed to finance its pension debts from other revenue sources. Therefore, pension benefits are more likely to rise smoothly, in which case family support will still be a key pillar for old-age support in the decades ahead.

As half of the older population remains unsupported by the pension system, and the issue of funding the current and future pension system is urgent, it is crucial to evaluate the effectiveness of current pension reform. This is because, with government's various efforts to develop its pension scheme, it may have further crowded out support from children. For example, if private transfers are altruistically motivated, in which case an increase in pension benefits will crowd out private transfers, pension policy may not have the intended effect. Instead, government may increase pension benefits more to cover the potentially crowded-out private transfers to maintain the well-being of older people. However, one cannot just state that this will happen without providing an in-depth scientific analysis. In the next chapter, the data and methodology I adopt to estimate transfer derivatives will be introduced in detail.

Chapter 5: Data and methodology

Two research questions were proposed in Chapter 1: Will the trend of living arrangements weaken private transfers? Will an increase in public transfers further crowd out private transfers? To answer these questions, the following hypotheses will be addressed.

Hypothesis 1: Old parents with more financial or instrumental needs are more likely to live with children.

Hypothesis 2: Living distance from children has a negative and significant effect on occurrence of receiving intergenerational transfers.

Hypothesis 3: Conditional on intergenerational transfers occurring, living distance from children has a negative and significant effect on the size of transfers.

Hypothesis 4: Old parents with higher incomes are less likely to receive financial transfers from children.

Hypothesis 5: Conditional on intergenerational transfers occurring, old parents with higher incomes receive a smaller amount of financial transfers from children, supporting altruism theory and crowding-out hypothesis.

The two survey datasets used in this thesis are not available to the public. I was only allowed to use them when I became an affiliated research fellow at the China Research Centre on Ageing. This chapter will introduce the two datasets as well as methodology used in the following chapters in detail, and is organised as follows. Section 5.1 will give a general introduction of the datasets. Section 5.2 will explain the key variables used throughout this thesis and provide the statistical description. Section 5.3 will briefly outline the conceptual framework and specify the empirical models for understanding and estimating the determinants of intergenerational transfers. Section 5.4 will discuss the limitations of the datasets and methodology, and finally section 5.5 will conclude.

5.1 The Data

This thesis analyses data from the Sampling Survey of the Aged Population in Urban/Rural China (SSAPUR, referred to as the 2000 survey hereafter) and the Follow-up Sampling Survey of the Aged Population in Urban/Rural China (FSSAPUR, referred to as the 2006 survey hereafter), two nationwide studies of people aged 60 and over that were conducted by the China Research Center on Ageing (CRCA) in 2000 and 2006, respectively (CRCA, 2003; Guo & Chen, 2009). The SSAPUR and FSSAPUR were supported by the Ministry of Civil Affairs. At the time that they were collected, they were the only two official and nationally representative survey data focusing on Chinese older people in general. Other data sources include the Chinese Longitudinal Healthy Longevity Survey (CLHLS) and the China Health and Retirement Longitudinal Study (CHARLS). The CLHLS, initiated in 1998, was conducted using a randomly selected sample of half of the counties and cities of 22 provinces in China, mainly focusing on the oldest-old, aged 80 and over. The CHARLS was conducted in 2011, covering around 10,000 households and 17,000 individual adults aged 45 and older, and will be released by the end of 2012.

Trained interviewers from the local Committee on Ageing at neighbourhood or village level conducted the first wave of surveys in December 2000 with 20,255 respondents, including 10,171 participants from urban areas and 10,084 from rural areas. In June 2006, the second wave of data was conducted with 19,947 respondents, comprising 10,016 from urban areas and 9,931 from rural areas. The overall response rate was 98.6 and 97.4 per cent for the 2000 and 2006 survey, respectively. Interviews were conducted face-to-face, guided by structured and urban-rural stratified questionnaires with validated measurement properties. The surveys assessed Chinese older persons in terms of family relations, incomes, physical health status, and psychological well-being.

The SSAPUR and FUSSAPUR samples were drawn in five stages. Using a stratified multi-stage and Probability Proportional to Size[62] (PPS) Cluster Sampling, CRCA drew sample individuals from 20 provinces/municipalities in the East, South Central, Southwest, Northwest, North and Northeast Regions of China. There are 31 Provincial-level administrative divisions[63] (I refer to these as provinces hereafter) in China excluding Hong Kong Special Administrative Region and Macau Special Administrative Region. For technological and administrative reasons, the provinces selected in the 2000 Survey do not include Inner Mongolia, Guangxi, Guizhou and Tibet. Therefore, the provincial-level primary units are randomly selected from 27 provinces for the 2000 survey (31 provinces for the 2006 survey) in six macro-regions: North China, North-East China, East China, Middle-South China, South-West China. Theoretically, the sample sizes in each region should depend on the proportion of the number of people aged over 60 in each region over the total number of people aged over 60 in China.

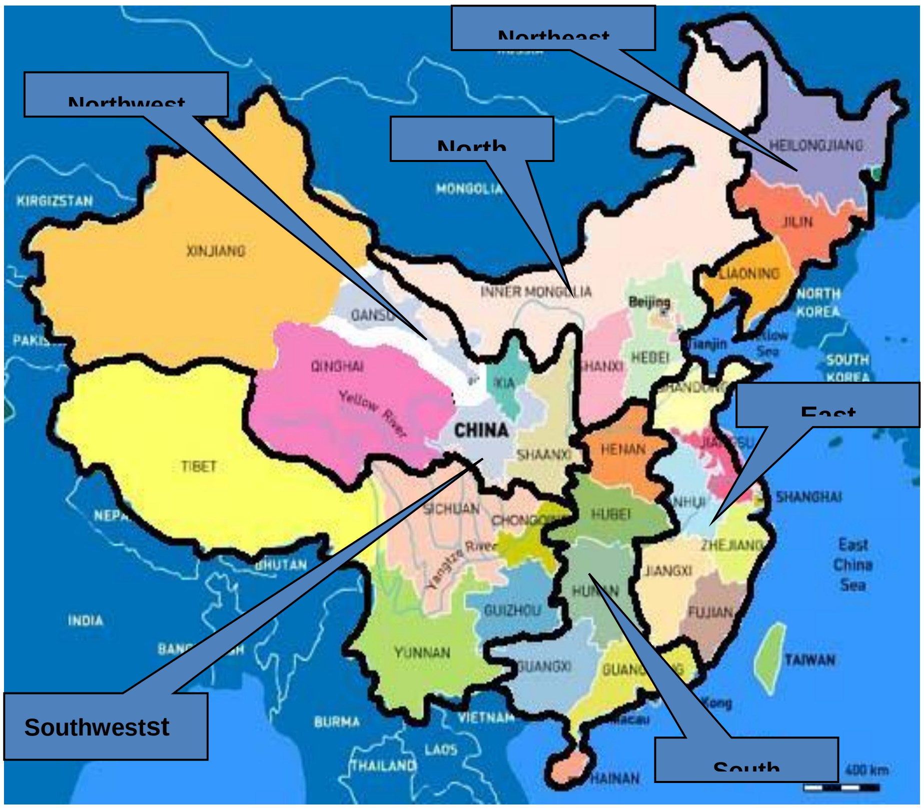
The number of provinces selected in each region is based on the demographic distribution of people aged 60 and over using statistics from the 1990 and 2000 Census.

[62] PPS sampling refers to sampling methods where the selection probability for each sampling unit is set to be proportional to its size, up to a maximum of 1. For example, if the population in province A is twice the population in province B, province A is twice as likely to be selected as province B in the survey.

[63] Provincial-level administrative divisions include provinces, autonomous regions of ethnic minorities (e.g. Guangxi) and municipalities under national supervision (e.g. Beijing and Shanghai). They all have province-level "rank" in the national administrative system, and I use the term "province" to refer to all of them.

Within each region, provinces were randomly selected using PPS. In the first-stage sampling process, 20 provinces were selected from 5 regions based on the proportion of older population in each province over the total older population in one region (Figure 5.1). Older population size refers to those aged 60 and over from the 1990 Census (for the 2000 Survey) and to those aged 60 and over from the 2000 Census (for the 2006 Survey). In each province, all city/county-level units were stratified in terms of whether they were urban cities (*shi*) or rural counties (*xian*), and by region within each classification.

Figure 5.1: *Sampling process: selection of provinces*



With a goal of sampling 8 city/county-level units (4 cities and 4 counties) per province, the cities/counties to be sampled in each province were determined based on the population size of those aged 60 and over from the 1990 Census for the 2000 survey (or the 2000 Census for the 2006 survey). In each city/county, 4 neighbourhoods (*shequ*), which comprised one or more resident committees (*juweihui*), in urban areas and 4 counties (*xiangzhen*) which comprise several village committees (*cunweihui*) in rural areas were selected using PPS sampling. We have 16 neighbourhoods (*shequ*) and 16 counties (*xiangzhen*), from which 50 resident committees (*juweihui*) and 50 village committees (*cunweihui*) were selected. A list of all households with at least one person aged 60 and over was provided by each resident committee (*juweihui*) or village committee (*cunweihui*). In the fifth-stage sampling process, 10 households were randomly withdrawn from each resident committee (*juweihui*) and village committee (*cunweihui*) respectively. If there was more than one person aged 60 and over in a household, an eligible sample was randomly selected from the associated Kish Table[64]. If an age-eligible person was too frail to answer questions, a proxy respondent was identified to help him/her to answer questions; usually a spouse or knowledgeable adult child, if there was one in the household. As a result, the survey aimed at interviewing 500 samples from urban areas and rural areas respectively in each province, making a full sample of 20,000 in total.

The 2006 survey made efforts to trace the same older individuals from the 2000 survey. I find 7424 individuals from both 2000 and 2006, using the criteria of same gender, same province and age differential between 3 and 8. The attrition is partially because four provinces (Tianjin, Jilin, Jiangxi and Gansu) in 2000 were replaced by another four provinces (Shanxi, Liaoning, Hunan and Guangxi) in 2006, which accounts for about 20 per cent of total samples. It is also likely to be due to natural death, rather than dropping out of the survey. Descriptive statistics for samples from both surveys are presented in Appendix 5.1.

Finally, one needs to bear in mind that "urban areas" in the two surveys only include cities and suburbs of the city, rather than towns or suburbs of towns, as some other statistics do (e.g. China Statistics Yearbooks). An individual's weight was calculated as the reciprocal of the sampling probability, i.e. the probability of an individual being selected, which is equal to the product of sampling probability from all six-stage sampling processes. For the whole thesis, I will use the weighted samples for descriptive statistics and the original samples for the multivariate analyses.

5.2 Variables

[64] A Kish Table is conducted using the Kish method, which allows the data collection team to randomly select participants from the household without involving data collection bias, to determine which individual from a household should be selected. For more details, please see Kish (1949) and Kish (1965).

The key variable of this thesis is the amount of private transfers old parents received from children. The questionnaires asked respondents "Did you receive money and gifts from your children in the last twelve months? If so, what are the cash values in total?" and "Did you give money and gifts to your children in the last twelve months? If so, what are their cash values in total?" I calculated the gross monetary transfer from children to parents from the first question, and the gross monetary transfer given to children from the second question. The net transfer amount is equal to the amount given to children subtracted from the amount received from children. Therefore, we need to bear in mind that intergenerational monetary transfers in this study indicate transfers between parents and all their adult children, rather than transfers between each parent-child pair in some previous studies (e.g., Chan, 2011; Lei, Giles *et al.*, 2012). In addition, average transfer amounts in this section were calculated conditional on the transfer that occurred, and are larger than the average private transfers.

For other variables, this thesis mainly concerns characteristics of old parents along three axes: demographics, health and socioeconomic status (SES). Demographics include geographical location (urban or rural), age, gender, marital status, number of children and living arrangements. Health related variables include a two-part linear score of self-rated health condition and ADL (activity of daily living) difficulty, and incidence indicating whether one is in a particularly poor health situation. Socioeconomic status (SES) has four dimensions: education level, working status, income composition and intergenerational transfer pattern.

Respondents were asked in which year they were born and what their Chinese zodiac sign[65] was. Older people's ages were deduced from the year of birth and the sign of the person. The survey classifies marital status into four categories: married, divorced (including separated), widowed, or single (i.e. never married). The health condition of older persons is measured by three variables: self-rated health status, the index of difficulties with activities of daily living (ADL) and whether respondents had some particular chronic disease. Although self-reported health status may not be an ideal indicator of health conditions, it has been shown to be a good predictor of subsequent ill health and mortality (Idler & Benyamini, 1997; Idler & Kasl, 1991). The SSAPUR and FSSAPUR questionnaires asked main respondents how they felt about their health (excellent=5, very good=4, good=3, fair=2 or poor=1). Moreover, respondents were asked whether they had difficulty performing a list of daily activities[66]. I allocate a value to each of the answers ("No difficulty"=1, "have difficulty"=2 and "can't do it"=3) and calculate the index of difficulty in ADL as mean values of the sum. From each question there are approximately 0.1% missing values, among which only 3 individuals did not answer all 16 questions. To include such 1%[67] samples, I simply appoint a median value of 2 to those with missing values in each health question. After coding the items with missing values, I summed the 16 scores, resulting in an index scale ranging from 16 to 48, with a higher score indicating serious difficulty in ADL or *vice versa*. The SSAPUR and FSSAPUR also asked whether respondents had some particular chronic disease. And if so, respondents were then asked whether or not it was diagnosed by a doctor.

[65] The Chinese Zodiac (known as *Shengxiao* in Chinese), is a scheme that relates each year to an animal and its reputed attributes, according to a 12-year mathematical cycle. It has a long history and has been widely used in several East Asian countries such as China, Korea and Japan.

[66] They are eating, dressing, using toilet, getting in and out of bed, sweeping the floor, shopping, cooking, washing clothes, lifting up 10 kilograms, financial management, walking 3 to 4 kilometres, taking a shower or bath, walking indoors, going up and down stairs, using phones, taking a bus.

[67] Individuals with missing values in questions 1 and 2, do not overlap with each other. Therefore, I have nearly 1% missing values in the conducted health index.

Respondents are categorised as having major diseases if they have one of the following: 1) heart attack, angina, congestive heart failure, or other heart problems, 2) cancer or malignant tumour (excluding minor skin cancers), 3) chronic lung diseases, or 4) stroke. Respondents are categorised as having minor diseases if they had any of the other illnesses. Otherwise, they are categorised as having no diseases.

Two variables here are used to measure educational level: year of schooling and a five-category educational classification. The surveys classify respondents' educational level into six discrete groups: illiterate, *Sishu*[68], elementary, middle, high school and college and above. Although categorised classification is normally better at capturing an individual's earning ability (employment and wages are more likely to be based on level of qualifications rather than years of schooling, e.g. resitting papers makes one spend one or two more years on a undergraduate degree, but it does not help earn more money than those holding the same degree), I show the average years of schooling as well.

Involvement in economic activity varies significantly between older individuals living in urban and rural China, because of the historical dual economic development model. Cities are much more industrialised and covered by a relatively highly-developed social security system protecting people against old-age poverty. Conversely, an agricultural economy is dominant in rural areas, where nearly no pension benefits are provided. With respect to involvement in economic activities, older people in cities and villages differ in terms of the way and the kinds of activities in which they get involved. While most urban workers are involved in formal and contracted jobs, most rural workers are involved in informal and family-based agricultural activities. As a result, the questionnaires asked respondents different questions. Urban respondents were asked if they had officially retired, and, if so, the types of work unit they belonged to prior to

[68] *Sishu* is a kind of old-style private Chinese education that mainly taught young children Chinese classics before the 20th century.

retirement. Urban respondents were also asked if they were involved in any paid work, regardless of whether they had retired or not. For rural respondents who do not officially retire, they were asked whether they were still farming or not.

Current income is often used to measure the financial welfare status of people, of which pension and private transfer are the most frequently discussed. The questionnaires asked a wide range of questions relating to respondents' income from a range of sources, including income from employment, financial assets (e.g. share and bank deposits), state pensions[69], private transfers (from children, relatives or friends), state benefits and other sources. Moreover, I divide parental income sources into market incomes, pension incomes, public transfers, private transfers and other incomes. I combine wage income, investment incomes (e.g. interest payments and dividends) and business incomes as market income because they only take a small proportion of total income. More importantly, wage income, investment incomes and business incomes differ from other incomes, which are not taxable.

Market incomes include wages from employment, benefits from business activities and investment (e.g. stock market), bank interest and benefit (or loss). For older people in rural areas, market incomes also include per capita[70] incomes from agricultural activities. Aside from rural-urban migrants working in cities, for most rural older residents incomes from agricultural activities such as farming, forestry, animal husbandry, and fishery are their main economic resources. The rural questionnaire asked respondents the costs and revenues from agricultural activities last year, from which I calculated the profits. I need to point out that agricultural activities may involve children's efforts[71], in which case they might be considered to be an in-kind transfer (e.g., children help cultivating parent's land and share profits). However, the data does not allow me to distinguish profits between

[69] There is nearly no private pension or insurance for people of these ages in China.
[70] Agriculture incomes divided by household size.
[71] This is especially the case for oldest old parents.

parents and children. What I can do is to simply calculate the per capita level. Public transfers include government aid, collective aid, enterprise retirement allowances and other allowances. Private transfers include transfers from children, grandchildren and other relatives. Other income includes insurance payments, donations from friends, and all other income.

"Pension" in this thesis refers to retirement (lay-off) pension or social security pension. The questionnaires asked "How much retirement (lay-off) pension[72] (or social security insurance) do you receive monthly?" (question c1 in the survey) and "Did you receive social security insurance last year? If so, how much?" (question c4c in the survey). However, there are not good definitions of retirement pension or social security insurance which allow non-professional Chinese older people to identify them. Moreover, although only 0.44% of the total sample did not respond to the question of whether they received social security insurance, 43% of those who received social security insurance did not report the amount received. So social security pension from question c4c is not a reliable variable here. There are 2281 (23% of the urban sample) respondents who did not answer question c1[73], among whom 90% said they did not receive social security pension and 9.7% said they received social security pension from question c4c. Of those who reported receiving pension from question c1, only 3% of "retirement and pension income" recipients reported such income had been delayed. As a result, "pension" from question c1 is more reliable and provided the information needed. To include more samples in this study, I combined variables from these two questions by treating respondents with missing values in question c1 but who answered "no" in question c4c as non-pension receivers, and the amount from question c4c as the amount of pension received for those with missing values in question c1.

[72] Lay-off pension refers to monthly income once an individual has been laid-off.
[73] I presume that those with missing values here did not receive pension monthly.

Table 5.1: *Descriptive statistics for urban and rural samples, 2006*

	Urban		Rural		
Characteristics	M	SD	M	SD	Range
Age	69.42	6.97	71.39	7.25	60 - 103
Men	0.48	0.50	0.49	0.50	0 (no), 1 (yes)
Married	0.82	0.39	0.74	0.44	0 (no), 1 (yes)
Widowed	0.18	0.38	0.25	0.43	0 (no), 1 (yes)
Year of schooling	6.39	4.51	2.32	2.99	0 - 25
Number of children	3.11	1.44	4.01	1.71	0 - 13
Lived with children	0.41	0.49	0.56	0.50	0 (no), 1 (yes)
Household size	3.15	1.71	3.82	2.28	1 - 31
Children Not Filial	0.01	0.11	0.03	0.17	0 (no), 1 (yes)
Total annual income	11586	10874	2967	2994	0 - 98292
Regular consumption	395.21	786.42	153.48	365.22	0 - 30000
Received transfers	0.35	0.49	0.61	0.48	0 (no), 1 (yes)
Gave transfers	0.19	0.59	0.07	0.35	0 (no), 1 (yes)
Received pension	0.78	0.41	0.05	0.21	0 (no), 1 (yes)
Still worked	0.06	0.24	0.45	0.50	0 (no), 1 (yes)
Self-rated health	3.09	0.86	2.95	0.89	0 - 5
Difficulty in ADL	19.34	6.17	21.39	6.53	16 - 48
Owned property	0.78	0.41	0.61	0.49	0 (no), 1 (yes)
Had savings	0.29	0.45	0.10	0.30	0 (no), 1 (yes)
Help with babysitting	0.42	0.49	0.35	0.48	0 (no), 1 (yes)
Help with house work	0.32	047	0.42	0.49	0 (no), 1 (yes)
Beijing	0.054	0.226	0.046	0.210	0 (no), 1 (yes)
Shanghai	0.050	0.217	0.051	0.219	0 (no), 1 (yes)
Heilongjiang	0.050	0.218	0.049	0.216	0 (no), 1 (yes)
Shan3 xi	0.050	0.218	0.050	0.218	0 (no), 1 (yes)
Jiangsu	0.050	0.218	0.051	0.219	0 (no), 1 (yes)
Zhejiang	0.050	0.217	0.051	0.219	0 (no), 1 (yes)
Hubei	0.050	0.217	0.050	0.219	0 (no), 1 (yes)
Sichuan	0.050	0.218	0.050	0.218	0 (no), 1 (yes)
Yunnan	0.050	0.218	0.051	0.220	0 (no), 1 (yes)
Guangdong	0.050	0.218	0.050	0.219	0 (no), 1 (yes)
Fujian	0.050	0.217	0.050	0.219	0 (no), 1 (yes)
Anhui	0.050	0.218	0.051	0.220	0 (no), 1 (yes)
Hebei	0.049	0.215	0.050	0.217	0 (no), 1 (yes)
Shangdong	0.050	0.217	0.050	0.219	0 (no), 1 (yes)
Henan	0.050	0.218	0.049	0.216	0 (no), 1 (yes)
Xinjiang	0.050	0.218	0.051	0.219	0 (no), 1 (yes)
Shan1 xi	0.050	0.217	0.050	0.218	0 (no), 1 (yes)
Liaoning	0.050	0.217	0.050	0.218	0 (no), 1 (yes)
Hunan	0.050	0.218	0.050	0.217	0 (no), 1 (yes)
Guangxi	0.050	0.218	0.050	0.218	0 (no), 1 (yes)
Observations	9985		9846		

Table 5.2: *Descriptive statistics for urban and rural samples, 2000*

	Urban		Rural		
Characteristics	M	SD	M	SD	Range
Age	68.66	6.86	69.20	6.93	60 - 108
Men	0.48	0.50	0.49	0.50	0 (no), 1 (yes)
Married	0.75	0.43	0.64	0.48	0 (no), 1 (yes)
Widowed	0.24	0.43	0.34	0.47	0 (no), 1 (yes)
Year of schooling	5.35	4.84	1.65	2.60	0 - 24
Number of children	3.71	1.63	4.32	1.79	0 - 14
Lived with children	0.49	0.50	0.58	0.49	0 (no), 1 (yes)
Household size	3.26	1.70	3.67	2.08	1 - 33
Not Filial	0.01	0.12	0.02	0.14	0 (no), 1 (yes)
Total annual income	8612	8763	1549	2583	0 - 90000
Regular consumption	146.15	291.37	57.52	116.38	Monthly, 0 - 12020
Received transfers	0.39	0.50	0.65	0.48	0 (no), 1 (yes)
Gave transfers	0.18	0.55	0.10	0.49	0 (no), 1 (yes)
Received pension	0.69	0.46	0.04	0.21	0 (no), 1 (yes)
Still worked	0.10	0.29	0.43	0.50	0 (no), 1 (yes)
Self-rated health	3.10	0.92	2.95	0.93	0 - 5
Difficulty in ADL	15.57	4.81	17.37	3.88	13 - 39
Owned property	0.65	0.48	0.38	0.49	0 (no), 1 (yes)
Had savings	0.27	0.44	0.09	0.29	0 (no), 1 (yes)
Help with babysitting	0.40	0.49	0.46	0.50	0 (no), 1 (yes)
Help with house work	0.39	0.49	0.54	0.50	0 (no), 1 (yes)
Beijing	0.049	0.216	0.049	0.216	0 (no), 1 (yes)
Shanghai	0.049	0.216	0.049	0.216	0 (no), 1 (yes)
Heilongjiang	0.063	0.242	0.063	0.242	0 (no), 1 (yes)
Shan3 xi	0.049	0.216	0.049	0.216	0 (no), 1 (yes)
Jiangsu	0.048	0.214	0.048	0.214	0 (no), 1 (yes)
Zhejiang	0.047	0.212	0.047	0.212	0 (no), 1 (yes)
Hubei	0.049	0.216	0.049	0.216	0 (no), 1 (yes)
Sichuan	0.049	0.216	0.049	0.216	0 (no), 1 (yes)
Yunnan	0.049	0.216	0.049	0.216	0 (no), 1 (yes)
Guangdong	0.049	0.216	0.049	0.216	0 (no), 1 (yes)
Fujian	0.048	0.213	0.048	0.213	0 (no), 1 (yes)
Anhui	0.049	0.215	0.049	0.215	0 (no), 1 (yes)
Hebei	0.048	0.214	0.048	0.214	0 (no), 1 (yes)
Shandong	0.048	0.215	0.048	0.215	0 (no), 1 (yes)
Henan	0.049	0.215	0.049	0.215	0 (no), 1 (yes)
Xinjiang	0.049	0.217	0.049	0.217	0 (no), 1 (yes)
Tianjin	0.049	0.215	0.049	0.215	0 (no), 1 (yes)
Jilin	0.061	0.239	0.061	0.239	0 (no), 1 (yes)
Jiangxi	0.049	0.216	0.049	0.216	0 (no), 1 (yes)
Gansu	0.049	0.216	0.049	0.216	0 (no), 1 (yes)
Observations	10171		10084		

Table 5.1 and 5.2[74] present the descriptive statistics to provide a general view of the data. One can see that the samples were evenly distributed, about 5%, in each province in both 2000 and 2006. The average age of all samples is around 70, with an older average age of rural samples than that of urban samples, implying an older population in rural China. This is consistent with the previous finding that China's population ageing is more serious in rural areas than that in urban areas (Zeng & George, 2000). Regardless of living locations, there are slightly more women samples than men samples. As women usually have a longer life expectancy in most countries including China, a random selection process should imply a higher proportion of older females. More rural samples are at disadvantaged marital status (widowed) than urban samples. More urban older people attended school but have fewer children and a smaller household size than rural older people. This is not unexpected, because of the more developed economy and stricter implementation of birth control policy in urban areas[75]. As expected, a higher proportion of rural old parents co-resided with children. By contrast, the proportion of old parents who think their children are not filial is higher in rural areas than in urban areas. Urban older individuals have a much higher annual income (about four times) than older individuals in rural areas, while incomes for all older people have increased significantly from 2000 to 2006. Regular monthly consumption reflects the same time trend and urban-rural difference; while regular consumption of both urban and rural older people grew during these periods, the former have a much higher level of regular consumption than the latter.

In 2006, more than three quarters of urban samples received pension benefits, while only 5% of rural samples did so. As I have discussed in chapter 4, China implemented its new rural social insurance in 2009, before which there were only a small number of rural

[74] In this section, 116 samples with missing values in income, number of children and consumption were dropped.

[75] See chapter 3 for more details.

residents receiving pensions (e.g. those working in government and public institutes). Although the proportion of 78% of urban older individuals receiving pensions is higher than previous studies have estimated, we need to bear in mind that urban areas in the survey include cities only, which is in contrast to the measurements most other studies used, that includes cities and townships. Therefore, it is reasonable that in cities, the proportion of older people receiving pension benefits is higher than those in cities and townships. Perhaps because of financial difficulty, the proportion of rural older persons who still worked (farmed) is a lot higher than that of urban older persons. The descriptive statistics find that while a higher proportion of rural samples received money transfers from children than urban samples, a higher proportion of the latter gave money to children than the former. This is consistent with the findings from previous studies (see chapter 2), namely that private transfer is an important income resource for the aged, especially in rural China. Finally, urban older persons are physically healthier than rural older persons, reflected by both a higher self-rated health condition and a lower index of difficulty in Activities of Daily Life (ADL).

An initial look of the descriptive statistics therefore demonstrates that the datasets are equally distributed in each province, and that the urban-rural difference matches the current circumstances of China. Table 5.3 further shows that the age distribution of samples conforms to reality, with the percentage of older sample decreasing with age.

I do not present the information on the number of children and living arrangements in this chapter. All main respondents were asked whether they had surviving children and, if so, how many, and where they were living (this household, another village/neighbourhood in this county/city or another county/city). Detailed information on the number of children and living arrangements will be presented in chapter 5. In the following section, I will explain the measurement and reliability of key variables in this thesis in detail and discuss some preliminary implications by showing cross-tabulating statistics and figures.

Table 5.3: *Age distribution by living location and gender, 2000 and 2006*

	2000			2006		
Age Group	Total Percentage	Male Percentage	Female Percentage	Total Percentage	Male Percentage	Female Percentage
All Samples						
Total	100	100	100	100	100	100
60 - 64	31.88	34.03	29.83	30.26	31.70	28.87
65 - 69	26.75	27.70	25.86	25.54	26.49	24.63
70 - 74	19.75	19.69	19.82	20.59	20.73	20.46
75 - 79	12.38	11.42	13.29	13.13	12.56	13.69
80+	9.24	7.17	11.21	10.48	8.52	12.36
Urban (Cities)						
Total	100	100	100	100	100	100
60 - 64	33.50	34.28	32.76	29.41	29.88	28.97
65 - 69	27.78	28.69	26.93	26.62	26.95	26.32
70 - 74	19.16	19.67	18.68	21.08	21.57	20.63
75 - 79	11.18	10.65	11.68	13.00	13.09	12.91
80+	8.38	6.71	9.95	9.89	8.51	11.16
Rural (Villages)						
Total	100	100	100	100	100	100
60 - 64	31.38	33.96	28.93	30.56	32.34	28.84
65 - 69	26.44	27.40	25.53	25.15	26.33	24.01
70 - 74	19.93	19.69	20.17	20.42	20.44	20.39
75 - 79	12.75	11.65	13.79	13.18	12.37	13.97
80+	9.50	7.31	11.59	10.69	8.52	12.79

5.3 Theoretical model and statistical issue

To study the transfer motives, a conceptual model was adapted from previous work in the existing literature in the field (Cai, Giles *et al.*, 2006; Cox, Hansen *et al.*, 2004; Gibson, Olivia *et al.*, 2011). It is useful to start with a basic utility model:

$$U_d = U\left(C_d, s, V\left(C_r, s, U_d\right)\right)$$

U is the utility (well-being) of individual *d* (donor) and V is the utility (well-being) of recipient *r*. C_d and C_r are consumption levels for donor *d* and recipient *r*, respectively. Services[76] provided by *r* to *d* as part of an exchange relationship are denoted by s. If the donor and recipient care about each other, we should have $\partial U/\partial V>0$ and $\partial V/\partial U>0$, which suggests the possibility that altruistic transfers may be observed. If donor *d* enjoys services from recipient *r*, i.e. $\partial U/\partial s>0$, and *r*'s utility falls with provision of services and must be compensated for any services provided, in other words, $\partial V/\partial s<0$, we may observe exchange motives.

Assuming donor and recipient are engaged in a bilateral monopoly where neither transfers nor services have market substitutes, transfers exactly compensate for services because the donor dominates the bargaining arrangement. Assuming recipient *r* has borrowing constraint, the budget constraints (how much money he or she can spend) should equal the pre-transfer transfer incomes plus transfers received from *d* and minus transfers given to *d*, i.e.

$$C_r = I_r + T_r^I - T_r^O$$

Where T_r^I is the value of transfers received, T_r^O is the value of transfers given and I_r is the value of pre-transfer incomes. If we denote T_i^N as net transfers in, or $T_r^N = T_r^I - T_r^O$, *r*'s budget constraints become:

$$C_r = I_r + T_r^N$$

[76] Recall that "service" in the exchange hypothesis is a catchall term standing for anything that the recipient provides the donor in exchange for money: help with shopping, home repairs, gardening and childcare.

If transfers are altruistically motivated, we expect $\partial T_r^N / \partial I_r < 0$, since *d* believes that more transfers will be necessary to improve or to maintain *r*'s welfare as pre-transfer income falls. If transfers are exchange motivated, the signs of T_r^N and I_r will be ambiguous. If we consider transfers as the product of an implicit price of services, p, and the quantity of service, s, it is easy to show that $\partial s/\partial I < 0$ and $\partial p/\partial I > 0$. So transfers can rise or fall with I_r depending on the price elasticity of service s, just as discussed in Chapter 2. If the price effect dominates the quantity effect (demand of s is elastic), T_r^N will decrease with I_r. Conversely, if the quantity effect dominates the price effect (demand of s is inelastic), T_r^N will increase with I_r. Furthermore, if transfers both rise and decline with I_r, Cox, Hansen *et al.* (2004) have shown that they will first rise and then decline, generating an inverted-U-shaped relation to recipient income. They also proposed that altruism prevails when recipient income is at low level, while transfers become exchange motivated once recipients are sufficiently well-off. They explain this result based on the assumption of participation constraints among recipients.

To further understanding, it might be useful to unpack the above argument in a different light; for example, in the context of a three-generation household, with parents and children. In this scenario, you are the only one giving money transfers to your parents, and they are the only people who can babysit your children. If your parents have very low incomes, giving them money or buying them clothes and food will make them much better off and make you happy, simply because you are altruistic. However, if your parents suddenly become wealthy, you would probably not give them as much by way of monetary transfers as before, because they are less needy. When you think your parents are financially stable, you may stop giving money, at which point the transfer motive switches from altruism to exchange. Equally, if your parents are financially stable but are still baby-sitting your children, you would be likely to be happy to give them money or gifts as rewards. However, should your parents suddenly become extremely wealthy, you may start feeling sorry because the money or gifts that you gave them yesterday pale in comparison with their new incomes, or may not be enough to compensate them for their assistance. Therefore, you start giving more monetary transfers, until your parents become millionaires. If this is the case, you will probably not ask for them to babysit as much as before, because they would like to have more leisure time and you would find it difficult to ask them to babysit and make them happy at the same time. As a result, you ask for less baby-sitting and start making fewer monetary transfers to your parents.

Figure 5.2 *Relationship between pre-transfer incomes and private transfers*

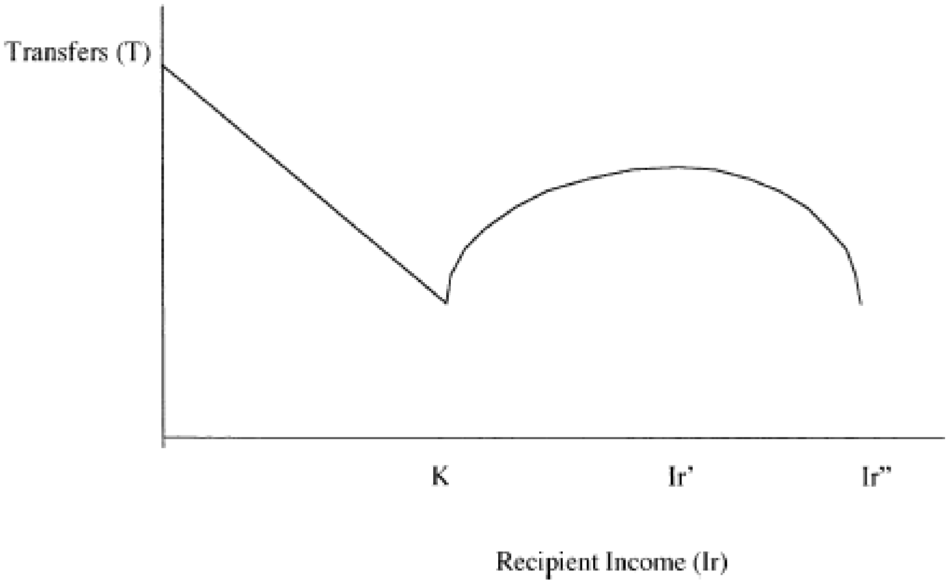


Fig. 1. The relationship between private transfers and income.

Source: Cox, Hansen *et al.* (2004), Figure 1.

Figure 5.2 depicts the proposed relationship between recipient pre-transfer incomes and transfers. Private transfers are altruistically motivated at low income level of recipients, and are negatively associated with recipient incomes. When recipient incomes reach the cut-off level, K, private transfers become exchange motivated and exhibit an inverted-U-shaped association with recipient incomes. According to the model, an increase in public transfers could either “crowd out” or “crowd in” private transfers, depending on the recipient income level. The relationship between net-transfer and pre-transfer income is described in the follow equation:

$$\mathrm{T}_{\mathrm{r}}^{\mathrm{N}} = \mathrm{f}\,(\mathrm{I}_{\mathrm{r}}) + \mathrm{X}_{\mathrm{r}}'\,\gamma + \varepsilon_{\mathrm{r}} \tag{1}$$

Where X_r is a vector of characteristics such as age, education and the amount of services provided which influence how much transfers children would like to give.

Therefore, my target is to estimate the sign of $\mathrm{f}\,(\mathrm{I}_{\mathrm{r}})$. Before doing so, it is also important to investigate a little further the transfer decision, in other words, the determinants affecting a child’s decision, later in life, whether or not to support his or her parents. Analyses of transfer decision will be based on the results of logistic regression on parental characteristics. A logistic model is a non-linear binary model in which the response variable y_i can be only one or zero, and the explanatory variables x_i are estimated in the following index model:

$$P_r\,(y_i = 1\,|X_i) = G\,(\beta_i \mathrm{X}_{\mathrm{i}}')$$

where G is a cumulative density function, monotonically increasing in the scalar $x\beta$.

$$G\,(\beta_i x_i) = \frac{\exp(\beta_i x_i)}{1 + \exp(\beta_i x_i)}$$

The logistic model is estimated by means of maximum likelihood. That is, the maximum likelihood estimate of coefficient is the particular vector that gives the greatest likelihood of observing the outcomes in the sample $\{y_1 \ldots y_k\}$, conditional on the explanatory variables $\{x_1 \ldots x_k\}$. The dependent variable is a binary variable that equals to one if old parents received from their children a larger amount of financial support than the amount parents gave, i.e. received net transfers. Therefore in the logistic regression, a positive sign of an estimated coefficient indicates that such variable helps or increases the probability of receiving net transfers from children. In the logistic regressions, moreover, if the amount the parents received from their children was the same or smaller than the amount they gave, then I regard the net amount received as zero and code the incidence of receiving support as zero.

Now we come back to the relationship between recipient pre-transfer incomes and the amount of net transfers in equation (1). Assuming the relationship between $\mathrm{I_r}$ and $\mathrm{T_r^N}$, which is $\mathrm{f}\,(\mathrm{I_r})$, is linear, we shall obtain:

$$\mathrm{T_r^N} = \mathrm{I}_r\alpha + \mathrm{X_r'}\gamma + \varepsilon_\mathrm{r} \qquad (2)$$

A usual way to estimate α, the sign and size of the recipient income impact on private transfers, is to run an Ordinary Least Square (OLS), as adapted by many previous studies. However, endogeneity may arise from the control variables in equation (2) and will generate biased estimates. A good example for endogeneity is school performance in wage regression. Generally speaking, school performance is positively associated with IQ, but it is not likely to be observed in any survey. However, IQ may have a positive effect on wages, and therefore given other conditions (or variables) are the same, an individual with higher IQ is likely to earn more. If this is the case, the variable of school performance is “endogenous”, and regression of wage on school performance without controlling for IQ will produce an upward bias because the estimate of school performance captures the positive effect of IQ and generates a larger coefficient.

In this study, variables such as parental education may be endogenous, because parents’ education may relate to children’s education which affects children’s transfer ability. I ignore the potential endogeneity from other variables and only allow the key control variable, pension (and change in pension), to be endogenous in this study. Since in urban areas pension benefits are tied to current provincial wage level (see section 4.1 of chapter 4) and most children worked in the same province as their old parents (see chapter 6), changes in pension benefits are likely linked to changes in children’s eventual wages. Change in pension may be endogenous in the sense that it may correlate with the error term in equation (4). I also correct for endogeneity from the variable of pension to reduce potential bias.

The two stage least squares regression (2SLS) by use of instrument variables (hereafter “IV”) and the control function (CF) methods are two standard ways to deal with endogeneity. Assume a regression of pension:

$$\mathrm{I}_r = \mathrm{M}_\mathrm{r}' z + \mathrm{X}_\mathrm{r}' \gamma + \upsilon_\mathrm{r}$$

Where M_r is a vector of Instrument Variables, X_i is a vector of other exogenous variables as in equation (1) and υ_r is the error term. At the first stage, I regress I_r on a set of instrument variables M_r plus same X_r' in equation (1) and get the predicted values (reduced forms) of I_r ($\widehat{\mathrm{I}_r}$) and the error term υ_r ($\widehat{\upsilon_\mathrm{r}}$). The use of 2SLS implies the inclusion of ($\widehat{\mathrm{I}_r}$) and the use of CF method implies inclusion of $\widehat{\upsilon_\mathrm{r}}$ in the second-stage OLS regression of equation (2). The inclusion of $\widehat{\mathrm{I}_r}$ thus “controls” for the endogeneity of pension in the original equation and the OLS estimates will be unbiased and consistent. Finally, the OLS estimates of z and γ are identical for using these two methods if the endogenous variable exhibits a linear relationship, though with slightly different t statistics. I decide to use the 2SLS methods in this study which yields the second-stage OLS regression of:

$$\mathrm{T_i^N} = \widehat{\mathrm{I}_r}\,\alpha + \mathrm{X_r'}\gamma + \varepsilon_\mathrm{r} \tag{3}$$

From chapter 4 we know that the pilot project of funding empty individual accounts was initiated in Liaoning in 2001, and was expanded to Heilongjiang and Jilin provinces in 2004. The pilot projects will likely increase pension incomes for retirees in certain provinces, or at least increase children's expectation of parents' pension incomes. The 2000 and 2006 surveys used in this thesis cover the periods before and after the pilot projects came into effect and I take advantage of this exogenous change. Because changes in amount of pension incomes (or expectation of pension incomes) vary across provinces, I create interaction terms for the time dummy (2006=1, 2000=0) and province dummies (e.g. Beijing=1, not Beijing=0) as IVs. After pooling the two waves of the dataset, there are 24 provinces in total, and 24 IVs created. The P-value of the Sargan tests from each estimated 2SLS equation is then reported to test the validity of IVs. The joint null hypothesis of a Sargan test is that the IVs are valid (i.e. are jointly exogenous), uncorrelated with the error term from the estimated equation, and that the excluded instruments are correctly excluded. A rejection throws doubt on the validity of the instruments. By contrast, failure to reject the null indicates a lack of statistical evidence against the validity of the instrumental variables (Baum, Schaffer *et al.*, 2003).

The first difference regression exploring the panel nature of the datasets is another effective way to reduce endogenous bias. This is because if I take the differential of all the variables from the 2006 survey and their counterparts from the 2000 survey, of those variables that do not vary across time, either observable or unobservable variables (e.g. ability helping children to find a job, IQ and investment in children's education) will be offset. Assuming $\Delta N = N_{2006} - N_{2000}$, where N represents any variable, N_{2006} is the value of N in 2006 and N_{2000} is the value of V in 2000, taking difference of all variables in equation (2) gives:

$$\Delta \mathrm{T}_{\mathrm{r}}^{\mathrm{N}} = \Delta \mathrm{I}_{\mathrm{r}}\beta + \Delta \mathrm{X}_{\mathrm{r}}'\gamma + \varepsilon_{\mathrm{r}} \tag{4}$$

Although β in equation (4) models the impact of the change in pre-transfer incomes on the change in net transfers, it has the same sign of α (the impact of pre-transfer incomes on net transfers). Actually, α can be calculated from β. More importantly, as unobserved time invariant variables are offset, the OLS estimate of β in equation (4) suffers less bias than that of α in equation (2).

So far I have discussed several linear models to estimate transfer derivatives. However, the relationship between pre-transfer incomes and net transfers may not be linear. The model proposed by Cox, Hansen *et al.* (2004) implies a non-constant transfer derivative if the possibility that the two motives co-exist is taken into account. If this is the case, linear modelling will generate the wrong prediction of transfer derivative and transfer motive. Cox, Hansen *et al.* (2004), Cai, Giles *et al.* (2006) and Gibson, Olivia *et al.* (2011) used the threshold parametric model to estimate transfer derivatives below the threshold level and above the threshold level of pre-transfer incomes. However, the threshold model only allows for a knot point, namely a U-shaped or an inverted-U-shaped transfer derivative with one change in direction. Here I adapted a less restrictive semi-parametric approach proposed by Yatchew (2003) which allows the transfer derivative to change smoothly along the pre-transfer income level. The semi-parametric model works as follow. Recall equation (1):

$$T_r^N = f\,(I_r) + X_r'\,\gamma + \varepsilon_r$$

I first rank all samples by I_i, which is pension for urban samples and all pre-transfer incomes for rural samples. I then difference the observations in the sample to obtain:

$$\Delta T_r^N = \Delta f(I_r) + \Delta X_r'\gamma + \Delta\varepsilon_r$$

Given any variable L, ΔL indicates the difference between L_r andL_{r-1}, where *r* indicates a sample, and *r*-1 indicates the one next to him/her (ranked by I_r). Since I_r is bounded as the sample size increases, $\Delta f(I_r) \approx 0$ as $f(I_r) - f(I_{r-1})$ approaches zero, and the above equation reduces to:

$$\Delta T_r^N = \Delta X_r'\gamma + \Delta\varepsilon_r$$

As long as I_r and other independent variables are not perfectly correlated, OLS estimation of the above equation will provide consistent estimates of γ. In order to estimate the non-parametric relationship, $f(I_r)$, the estimated coefficient, $\hat{\gamma}$, are used to calculate

$$u_r = T_r^N - X_r'\hat{\gamma} = f(I_r) + \varepsilon_r \qquad (5)$$

Finally I am able to use locally weighted regression to estimate the semi-parametric relationship between the response of transfers $f(\mathrm{I}_r)$, to pre-transfer income, I_r.

5.4 Limitations

The data upon which this thesis is based shares the many of the same limitations as some previous work. Firstly, the data does not have satisfactory measures of other dimensions of intergenerational transfer, such as instrumental and emotional transfers. Without these measures, I am not able to thoroughly test various theories or models of intergenerational transfer motive. Instead, this thesis is focused on a narrower question of whether intergenerational financial transfers are dominated by altruism and exchange motives in China. Secondly, very little information is available about the adult children and siblings of respondents. Key variables, such as the age of children and siblings, education, income, working status, marital status, and gender, are missing. As the family network is a potential source of transfers, such unobservable variables may bias analyses of the transfer motive. According to the transfer theories that I discussed in chapter 2, the transfer amount increases positively with donor's income. Moreover, parent's income and children's income may be positively correlated, because wealthier parents are better able to provide educational and employment opportunities to their children. If this is the case, omitting children's income from the analysis will introduce some degree of positive bias on the parent's income coefficients. Thirdly, measurement errors of transfers may exist, and bias the results, because respondents may not tell interviewers their incomes, or may not remember correctly the exact amount of money given to or received from children.

However, all survey data suffer the same issue of measurement error. In fact, all interviews were arranged by either local resident committee members in cities, or by village heads in counties, and were conducted by staff from the local Committee on Ageing and on behalf of the Minister of Civil Affairs. This makes the survey more formal and is likely to make interviewees feel more responsible and less likely to give false responses. I believe that, in this sense, the data here is reliable, and should not suffer more measurement errors than any other survey data in the same field. Finally, income resources of old parents in rural areas are not clearly classified. It is likely that children help their old parents farm during busy farming seasons. In such circumstances part of the incomes derived from farming should be counted as in-kind transfers. However, the survey does not allow me to separate such children's in-kind assistance from parents' income.

5.5 Conclusion

I have introduced the datasets in this chapter, including the sampling methods and the measurement of key demographic and socioeconomic variables that will be used in this thesis. The measures for main parental characteristics are summarised in Appendix 5.2. The SSAPUR and FSSAPUR were supported by the Ministry of Civil Affairs and conducted by the China Research Centre on Ageing. They are the only two nationally representative surveys focusing on the Chinese population aged 60 and over. The descriptive statistics have shown that the datasets are evenly distributed in each province and amongst age groups, and provide a good match for reality. Although there are limitations, the datasets used in this thesis still have some advantages compared to other data sources regarding the Chinese older population and are the best dataset to which I could get access. With the unique setting of SSAPUR and FSSAPUR, I am able to compare and contrast the transfer patterns between urban and rural China. Because of their radical variance in terms of social and economic development, and social security system, the transfer patterns are likely to be significantly different between the two areas. The datasets combine a large and multi-dimensional volume of information on old parents, and also allow me to investigate whether different sets of determining factors of intergenerational transfers apply in urban and rural areas. In addition, the nature of the two phases of dataset enables me to analyse the time trend over the periods from 2000 to 2006. More importantly, findings from urban areas are useful in helping to predict future needs in rural areas, since the former is a few decades more advanced than the latter. This carries special policy implications, because China has, since 2009, for the first time in its history, begun establishing a pension scheme in rural areas.

I have also introduced the methodology to estimate the effects of determinants of intergenerational transfers in this chapter. The methodology that I have adopted in this thesis has some advantages over methodology adopted in previous studies. Most of the previous work (e.g., Chan, 2011; Lee & Xiao, 1998; Liu & Reilly, 2004; Secondi, 1997) assumes a single, linear regime of transfer derivative, which is not realistic and may be unfounded. This is because several different motives may lie behind the private transfers that adult children make, and these motives may switch between one another as the income of parents changes. The non-linear methods I have adopted to investigate transfer motives in this thesis enabled me to take into account the co-existence of multi-transfer motives, and to present a non-parametric relationship between public transfers and private transfers. Moreover, the 2SLS methods are applied in this thesis as a control for potential endogenous bias from the key variable of pension incomes and change in pension incomes. This is different from previous studies that assume pension incomes are exogenous.

Appendix 5.1: *Descriptive statistics for urban and rural samples, panel data*

	Urban areas		Rural areas		
	Mean	S.D.	Mean	S.D.	Notes
Change in pre-transfer income	3022	7142	341	1339	
Change in pension	3344	5239	713	3466	
Change in ADL index	0.19	0.96	0.16	0.4	
Change in savings	3194	8169	356	8483	
(All below variables are values in 2000)					
Age	67.79	6.02	68.25	6.00	60-92
Male	0.52	0.50	0.57	0.50	0 (no), 1 (yes)
Widowed	0.27	0.44	0.37	0.48	0 (no), 1 (yes)
School year	5.42	4.90	2.08	2.89	0-22
Number of children	3.59	1.57	4.38	1.83	0-14
Co-resided with children	0.51	0.50	0.56	0.50	0 (no), 1 (yes)
Total annual income	8268.63	9727.33	2136.63	6524.24	0-90000
Regular consumption	150.58	309.00	64.90	136.78	0-7100
Received transfers	0.39	0.50	0.63	0.48	0 (no), 1 (yes)
Gave transfers	0.28	0.59	0.17	0.46	0 (no), 1 (yes)
Received pension	0.71	0.45	0.08	0.27	0 (no), 1 (yes)
Self-rated health	3.20	0.84	3.10	0.91	0 - 5
Difficulty in ADL	14.67	3.56	16.73	3.04	13 - 39
Owned property	0.66	0.47	0.44	0.50	0 (no), 1 (yes)
Had savings	0.30	0.46	0.11	0.31	0 (no), 1 (yes)
Help with babysitting	0.44	0.50	0.49	0.50	0 (no), 1 (yes)
Help with house work	0.42	0.49	0.59	0.49	0 (no), 1 (yes)
Beijing	0.06	0.24	0.04	0.20	0 (no), 1 (yes)
Shanghai	0.06	0.24	0.08	0.27	0 (no), 1 (yes)
Heilongjiang	0.08	0.26	0.06	0.25	0 (no), 1 (yes)
Shan3 xi	0.00	0.00	0.06	0.24	0 (no), 1 (yes)
Jiangsu	0.09	0.29	0.07	0.25	0 (no), 1 (yes)
Zhejiang	0.09	0.28	0.07	0.25	0 (no), 1 (yes)
Hubei	0.07	0.26	0.06	0.24	0 (no), 1 (yes)
Sichuan	0.02	0.15	0.04	0.21	0 (no), 1 (yes)
Yunnan	0.06	0.23	0.07	0.25	0 (no), 1 (yes)
Guangdong	0.07	0.25	0.07	0.25	0 (no), 1 (yes)
Fujian	0.05	0.23	0.07	0.26	0 (no), 1 (yes)
Anhui	0.07	0.26	0.04	0.20	0 (no), 1 (yes)
Hebei	0.05	0.22	0.06	0.24	0 (no), 1 (yes)
Shandong	0.08	0.27	0.06	0.24	0 (no), 1 (yes)
Henan	0.10	0.29	0.08	0.27	0 (no), 1 (yes)
Xinjiang	0.06	0.23	0.06	0.24	0 (no), 1 (yes)
N	3265		4030		

Appendix 5.2: *A summary of measures for main parental characteristics*

Characteristics	Measures
Age	The age of an older individual
Men	=1 if a respondent is a man, =0 if is a woman
Married	=1 if a respondent was married, =0 otherwise
Widowed	=1 if a respondent was widowed, =0 otherwise
Year of schooling	The number of year of schooling respondents attended
Number of children	Total number of surviving children of respondents
Number of unemployed children	Total number of unemployed children of respondents
Number of children in other city	Total number of surviving children lived in another city/county
Party Member	=1 if a respondent is a communist party member, =0 otherwise
Lived with children	=1 if a respondent lived with children, =0 otherwise
Household size	Number of people in respondents' household
Children Not Filial	=1 if a respondent reported children were "not filial" , =0 otherwise
Total annual income	Total incomes of a respondent for the last 12 months
Regular monthly consumption	Total consumption of a respondent for last month
Received transfers	=1 if a respondent received monetary transfers from children, =0 otherwise
Children's transfers	Total amount of monetary transfers received from children
Gave transfers	=1 if a respondent gave monetary transfers to children, =0 otherwise
Parents' transfers	Total amount of monetary transfers gave to children
Net transfers	The amount of transfers received from children minus the amount of transfer gave to children
Received pension	=1 if a respondent received pensions or retirement incomes, =0 otherwise
Pension	The amount of pensions or retirement incomes received for the last 12 months
Pre-transfer incomes	Total annual incomes of a respondent excluding transfers from children
Self-rated health	excellent=5, very good=4, good=3, fair=2 or poor=1
Difficulty in ADL	The index of difficulty in activities of daily living, rang from 16 to 48, lower score indicating better healthy condition
Chronic disease	=1 if a respondent has a major disease, =0 otherwise
Own property	=1 if a respondent own a property, =0 otherwise
Has savings	=1 if a respondent or his/her spouse prepare savings for their old age, =0 otherwise
Help with babysitting	=1 if a respondent help babysitting grandchildren, =0 otherwise
Help with house work	=1 if a respondent help doing house work for children, =0 otherwise
Have a formal job	=1 if a respondent is working in formal sectors, =0 otherwise
Still farming	=1 if a respondent is engaged in agricultural work, =0 otherwise
Self-employed	=1 if a respondent is engaged in, =0 otherwise
Retired from GNI	=1 if a respondent has retired from government and public institutions, =0 otherwise
Retired from SOE	=1 if a respondent has retired from state-owned enterprises, =0 otherwise
Retired from Collective	=1 if a respondent has retired from collective enterprises, =0 otherwise
Retired from private	=1 if a respondent has retired from private enterprises, =0 otherwise
Retired from other sector	=1 if a respondent has retired from other sectors, =0 otherwise

Chapter 6: The changing patterns in living arrangements and their impacts on intergenerational transfers

In chapter 3, I have presented the demographic trends, and showed the rapid population ageing process taking place in China which is resulting from the drastic decline in both fertility and mortality. In 2010, the proportion of people aged 60 or over accounted for 13.26% of China's total population. Moreover, there is little doubt that population ageing in China will continue: the growth rate of the older population is much faster than that of the total population. On the one hand, the unprecedented speed and the timing of population ageing will make China the first country to become aged before it becomes rich, implying that China will have less resources to handle problems associated with an ageing population. On the other hand, to date, China has not set up a social security system covering all the older population. So the family remains the main source of old-age support, especially in rural areas.

As addressed in the previous chapter, the fertility rate in China has been below the replacement level since 1995, and has declined to a level where it is among the lowest in the world, and the number of children has declined rapidly mainly due to the One-Child-Policy implemented in the past three decades. The younger generation, especially rural residents of working age, have moved into cities (or to other cities) in large numbers as the result of income inequality between regions and the policies that have stimulated labour mobility. These trends have reduced household sizes, generated changes in living arrangements, and raised the popularity of "empty nest families" (families where older persons live alone and do not co-reside with adult children) in both urban and rural areas. The significant decline in the number of children per household may reduce resources available to support older persons within families, and raises concerns about the reliability and sustainability of the family unit as providing the bedrock of old-age support in China.

6.1 Backgrounds

Living arrangements are vital to intergenerational transfers and welfare in old age, particularly in developing countries which lack social security systems that provide universal coverage. This is because the household plays a key role in providing social support and interactions, and determines the social role of older people (Waite & Hughes, 1999). In China, living arrangements for older people carry a special meaning. Within the Confucian paradigm, filial piety (*xiao*) regulates the relationship between children and their elders, requiring not only the fulfilling of duties relating to the taking care of parents, but also doing so with the right attitude (Ikels, 2004). Under the influence of Confucianism, older Chinese traditionally co-reside with one or more of their married children; usually the oldest son. The family-based support mechanism by which the young cared for the old was through shared living arrangements. For the full span of its two thousand year history, the Chinese family has functioned as a close-knit social unit from which, ideally, older persons would draw instrumental, emotional, and financial support (Wu & Schimmele, 2008).

Recent empirical evidence shows that co-residence with children in China has declined over time as a result of increased financial independence, changing norms, and land and housing reforms, which have enabled adult children and their old parents who preferred to establish their own households to do so more easily. Studies (Meng & Luo, 2008; Palmer & Deng, 2008) using China Household Income Project (CHIPs) data showed that older Chinese, particularly the urban elders, were increasingly living alone or only with a spouse, rather than living in an extended family with adult children. Meng and

Luo (2008) explained that such a trend in urban areas is due to housing reforms implemented during the 1990s that have increased housing availability, and thereby enabled older persons who preferred to live alone to do so. Palmer and Deng (2008) ascribed the decline in co-residence to the increasing financial independence caused by broadening of pension coverage. Another piece of research (Zeng & Wang, 2003), using macro census data of 1982, 1990 and 2000, demonstrated a similar trend of living arrangements for older people, and attributed it to significant changing norms, declining fertility, and increasing population mobility.

It is not yet clear how intergenerational transfer is affected by this trend of living away from children. On the one hand, if family ties are indeed weakening as a result of the prevalence of non-coresidence with adult children, then the traditional family-based transfer mechanisms may be ill-suited to supporting old parents. On the other hand, changes in living arrangements need not signal an end to adult children's responsibility for their old parents. Intergenerational transfers including money and in-kind transfers can occur across as well as within households. The question is whether such inter-household transfer mechanisms fully substitute for the traditional within- household transfers.

Previous studies in China did not present a clear correlation between living arrangements and intergenerational transfers. Benjamin, Brandt *et al.* (2000) used household level data in two provinces (Hebei and Liaoning), and found that older people who do not live in an extended household are slightly financially worse off than those who co-reside with children. The authors claimed that such a negative association between co-residence and the welfare of older people should be even stronger, because they also discovered that non-co-resident older people worked more. Another study (Sun, 2002), based on the 1994 Baoding survey, claimed that old parents living away from children are less likely to receive help with daily activities from their children; although the probability of receiving financial help was not affected by living arrangements in such circumstances. A similar result has been found by Zimmer and Kwong (2003), who attributed the insignificant impact of living arrangements upon monetary support to the fact that supporting a parent financially did not require living in proximity to him or her. More recently, a study (Lei, Strauss *et al.*, 2011) using the China Health and Retirement Longitudinal Study (CHARLS) in two provinces (Zhejiang and Gansu) found that adult children who lived far away were less likely to provide financial transfers to their parents, although they provided a larger amount of financial transfers than children who lived nearby, in the case where such upward financial transfers occurred.

This chapter seeks to extend current understanding of the dynamics of living arrangements among older Chinese by exploring two sets of nationally representative survey data, and investigating not only whether coresiding or not, but how far a parent lives from children. This is the first study to analyse the impact of living arrangements on intergenerational transfers using nationally representative survey data in China. Instead of the binary variable – coresident or not – used in previous analyses, this study introduces a trichotomous variable (live in the same household, live in the same city, not live in the same city) to measure potential effects of living arrangements (distance) on adult children's transfer behaviours. My first goal is to present a broad picture of the recent living arrangements and their trend between the periods of 2000 and 2006. I then will investigate what determines parents' actual living arrangements. Finally, I will examine the impact of living arrangements on intergenerational transfers. I have found that the increasing trend in non-coresidence has been accompanied by a rise in living close to adult children. This type of living arrangements resolves the apparent conflict between privacy/independence and family support.

The rest of the chapter is organized as follows. Section 6.2 shows descriptive statistics and the patterns of living arrangements. Section 6.3 presents and discusses the empirical results of the determination of living arrangements, the impacts of living arrangements on intergenerational transfers. I summarise the results and provide further discussion in section 6.4.

6.2 Descriptive statistics

6.2.1 Number of children

It will be recalled that in China, given only limited community and institutional service provision and the general unwillingness on the part of older people to live in care institutions (Chou, 2010), children are the main source of in-kind instrumental care for older people. Therefore, the number of children and the living arrangements become key components, and have important implications for well-being in old age. In this sense, co-residence or proximity can imply more instrumental care, and *vice versa*. All main respondents were asked whether they had surviving children and, if so, how many they had and where they were living (in this household, another village/neighbourhood in this county/city or another county/city). The survey did not collect the full fertility history of respondents. Instead, the information relating to children reflects those who are alive at the point when the survey was conducted.

Table 6.1 shows the average number of adult children of each older household. The term ‘adult child’ here refers to children aged 18 and over at the time when the survey was conducted, and here I do not make any distinction between whether they are respondents' natural children, stepchildren, adopted or fostered children. On average, respondents have more than three (3.60) children, and the older cohort have a significantly larger number of children (3.97 per couple for the oldest old), on average, than the younger cohort (2.93 per old person for those aged 60 to 64). Such an age-based pattern of number of adult children is true for older people in urban and rural areas. This would in the main have resulted from the One-Child-Policy implemented in late 1970s, which predominantly affects those of child-bearing age (those who were aged between 25 and 35 in the late 1970s, who became those who were aged between 60 and 70 in the samples).

Table 6.1: *Average number of children by age groups, 2006*

	All respondents	Urban areas	Rural areas
Age group	Number of children	Number of children	Number of children
All	3.60 (1.68)	3.21 (1.48)	3.99 (1.78)
60 - 64	2.93 (1.38)	2.47 (1.10)	3.36 (1.48)
65 - 69	3.38 (1.48)	2.98 (1.22)	3.83 (1.61)
70 - 74	3.82 (1.68)	3.42 (1.43)	4.25 (1.81)
75 - 79	4.05 (1.79)	3.67 (1.61)	4.43 (1.87)
80+	3.97 (1.94)	3.76 (1.87)	4.14 (1,98)
N	19744	9886	9858

Note: Standard deviations are reported in parentheses.

Table 6.2: *Average number of children by educational levels, 2006*

	Urban areas	Rural areas
	Number of children	Number of children
Education level		
Illiterate	3.78 (1.71)	4.12 (1.83)
Sishu	3.78 (1.62)	4.04 (1.88)
Elementary school	3.34 (1.42)	3.89 (1.70)
Middle school	3.02 (1.32)	3.68 (1.66)
High school	2.75 (1.24)	3.66 (1.60)
College and above	2.49 (1.13)	3.07 (1.78)
N	9886	9858

Note: Standard deviations are reported in parentheses.

This may also reflect the negative effects of education[77] and the traditional view of the extended family on their willingness to have children, given that younger elderly people are generally better educated and have weaker traditional family values[78]. We can

[77] Educated couples normally have fewer children also because education delays the timing of birth.

[78] Of course, children (especially boys) are also more desired in rural areas because farming is the main source of income in villages and men’s labour is much more highly valued.

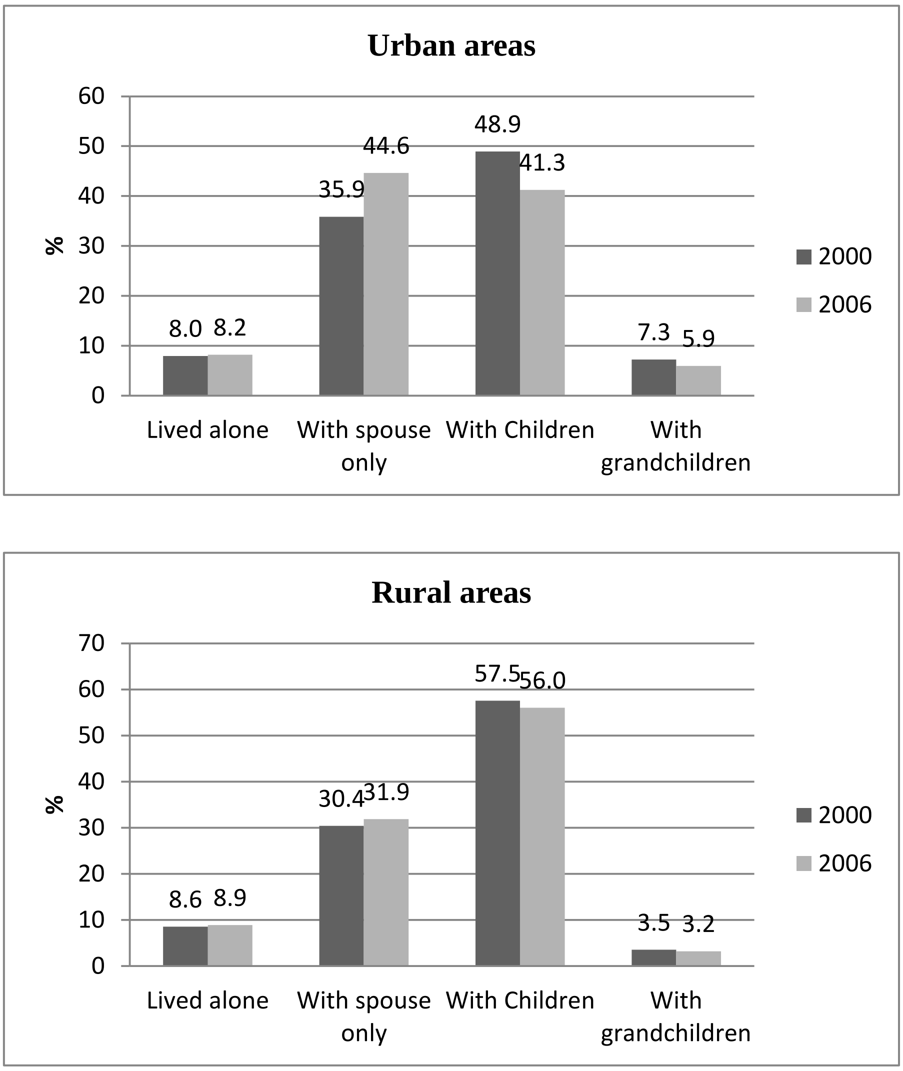
see from Table 6.2 that parents with higher educational level are more likely to have fewer children. This difference in the number of children is larger in urban areas than in rural areas. For example, on average, urban parents who finished high school have 1 fewer child than illiterate urban parents, and have 0.6 fewer children than those who finished elementary school. In rural areas, parents who finished high school (3.66) have a lower mean number of children than the illiterate (4.12) and parents who completed elementary school (4.04).

The statistics also show that old parents in rural areas have a larger average number of children than those in urban areas. This difference is true for all age groups (Table 6.1) and across different educational levels (Table 6.2). One possible reason for the greater willingness to have children among rural residents is that in the system of land economy, male labour is highly valued and is in greater demand in rural areas. More importantly, the traditional Chinese family system requires that married women join their husbands' extended family, while it is the married sons who are supposed to bear financial responsibility for the support of parents in old age (Whyte & Xu, 2003). This has direct consequences for the preference for sons. As a result, most of the Chinese take advantage of the adjustment of the One-Child-Policy. For example, rural residents are allowed to have a second child if their first child is a daughter.

6.2.2 Actual living arrangements

Two dimensions of living arrangements of the households of older persons are of interest: the overall numbers living with children, and the age patterns of those living with children. Each of these is discussed in this section. The 2006 statistics show that, in general, co-residing is still prevalent in China. About half of the respondents were living with their adult children. Moreover, most old parents (more than 95%) have some of their children living in the same county/city,[79] while only less than 3% of old parents (those that had children) did not have children living in the same province.

Figure 6.1: *Living arrangements between 2000 and 2006 by urban-rural areas*



Instead of the gender differential, here I focus on the difference in living arrangements (living alone, living with spouses only, living with adult children[80] and

[79] It includes those who had a geographically closest child living in this household and those who had a closest child living in another village/neighbourhood in this county/city.
[80] It includes one or some of the following cases: living with own son, living with own daughter, living with son-in-law, living with daughter-in-law.

living with grandchildren in skipped-generation households[81]) between urban and rural older people. The analysis of living arrangements (Figure 6.1) shows that the prevalent pattern of living arrangements for older people in urban areas switched from living with children (48.9% in 2000 and 41.3% in 2006) to living with spouses only (35.9% in 2000 and 44.6% in 2006) from the year 2000 to the year 2006. By contrast, living with children is still the dominant living arrangement for older people in villages (57.5% in 2000 and 56% in 2006), although there exists a slight decline in the proportion living with children (1.5%), and a tiny increase in the percentage living with spouses (1.5%), during these two periods.

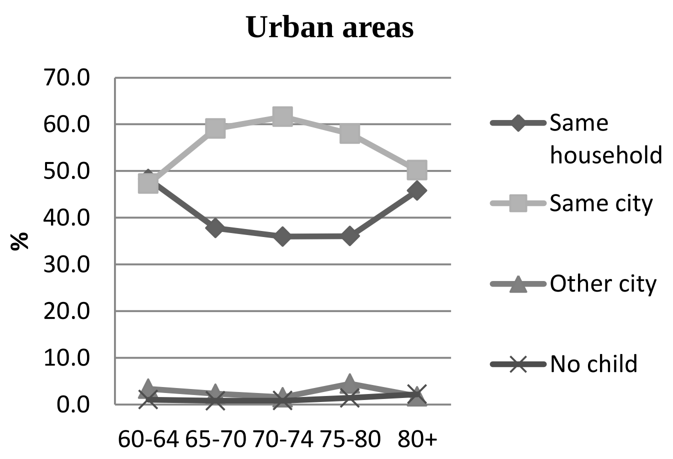
Moreover, the proportion of older people who live alone did not change between 2000 and 2006, and remained at approximately 8% for urban respondents. The percentage is marginally higher for the rural older people, and shows more increase (from 8.6% to 8.9%) over this period. It is slightly surprising that the prevalence of skipped-generation households is higher among older people in urban areas than in rural areas, although both exhibit a small decrease from 2000 to 2006. This may be because urban parents are financially more able to assist in the care of grandchildren. It also may be because grandchildren move to live with migrant parents, leaving older people (grandparents) in the villages.

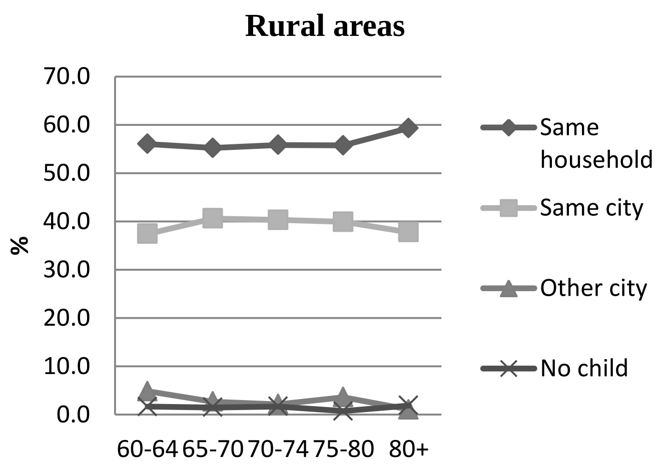
With respect to age patterns, I focus on how far adult children live from old parents' current living locations. Figure 6.2 shows the proportion of older households with the geographically closest (hereafter "closest") adult children in different locations: If one's closest child is living in the same household, it means he/she is co-residing with children; if one does not co-reside with children, but has at least one child who lives in another village/neighbourhood in the same county/city, he/she is classed as having a closest child

[81] It includes one of the following cases: living with spouse and grandchildren and not living with spouse but with grandchildren.

in the same city; having a closest child in another city indicates that an individual does not co-reside with their children or have a child living in the same city, but with at least one child living in another county/city in the same or different provinces. There is an alternative scenario: some old parents may only have children who live abroad. However, it is not likely that all adult children will move to another country, and this is found to be rare within the data. I decided to include old parents whose children all lived abroad in the category of "old parents with no child".

Figure 6.2: *Living location of geographically closest child by urban-rural areas, 2006*





The results show a clear age pattern of living arrangements: a U-shape relationship between the age of parents and co-residing with children, and an inverted-U-shape relationship between the age of parents and having a closest child living in the same city.

For example, 48% and 56% of individuals aged 60–64 co-resided with children in urban and rural areas respectively, while the proportions decrease to 36% and 55.8% for those aged 70–74 and grow to 45.8% and 59.3% for individuals aged 80 and over. Conversely, the proportion of parents not living with children but who have at least one child living in the same city increases from 47.3% and 37.4% for those aged 60 – 64 to 61.6% and 40.3% for parents aged 70–74 in urban and rural areas respectively. The ratios begin decreasing and reach 50.2% and 37.8% for the oldest old in urban and rural areas respectively (Table 6.3).

Table 6.3: *Percentage of older households with geographically closest child by age groups and living allocations, 2006*

	All	60 - 64	65 - 69	70 - 74	75 - 79	80+
Urban areas	%	%	%	%	%	%
Living with a child	41.3	48.25	37.77	35.97	36.08	45.80
Not living with a child, at least one child in same city	55.12	47.32	59.09	61.61	58.01	50.19
Not living with a child, no child in same city	2.70	3.37	2.32	1.58	4.49	1.79
No child	1.12	1.07	0.83	0.85	1.42	2.22
N	9978	1770	2743	2623	1669	1173
Rural areas	%	%	%	%	%	%
Living with a child	56.00	56.03	55.21	55.84	55.74	59.30
Not living with a child, at least one child in same city	39.17	37.44	40.59	40.30	39.90	37.75
Not living with a child, no child in same city	3.19	4.84	2.70	2.15	3.63	1.06
No child	1.54	1.68	1.51	1.71	0.74	1.89
N	9778	1881	2388	2425	1656	1428

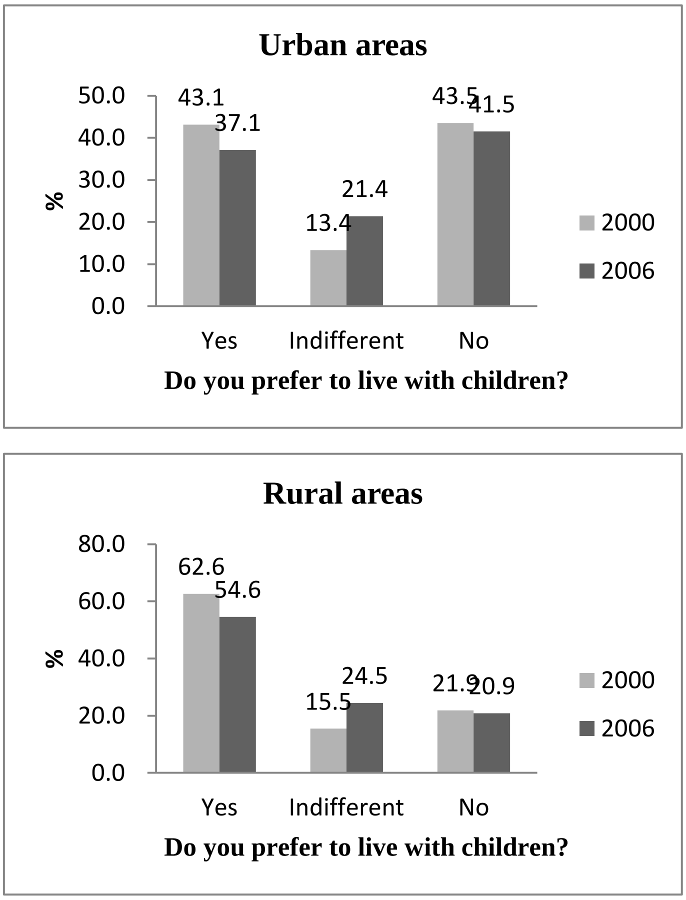
This suggests that as a parent becomes older, he/she is less likely to live with children, but is more likely to have at least one child who lives in the same city. But once an individual gets very old (around 75), the older he/she is, the more likely he/she will be to be living with children, but less likely to have a child living in the same city. Such age patterns are very clear for urban old parents, but less so for old parents in rural areas. This is likely to be due to the fact that rural couples have more children. In rural areas, even if one or some of children move out of the parental household, there is still a higher probability of having a child remaining in the same household than is the case in the urban context.

This age pattern of living arrangements is likely to occur for two main reasons. On the one hand, from both the children and the parent's point of view non-coresidence is becoming prevalent. As scholars (Logan, Bian *et al.*, 1998) have pointed out, the decline in co-residing decisions on the part of young elders should reflect the normal process of maturation and increasing independence of the adult child. Moreover, living in the same city with old parents is a supplement of co-residence. Despite the fact that many children of older people may have moved away, or may be in the process of moving out from their parental household, they still want to live close to their parents (e.g., in the same county/city) in order to be able to offer care. On the other hand, when old parents become frail, and are not able to take care of themselves, either their children move into the parents' household again to offer assistance, or old parents move to their children's household to obtain assistance

6.2.3 Preference of living arrangements

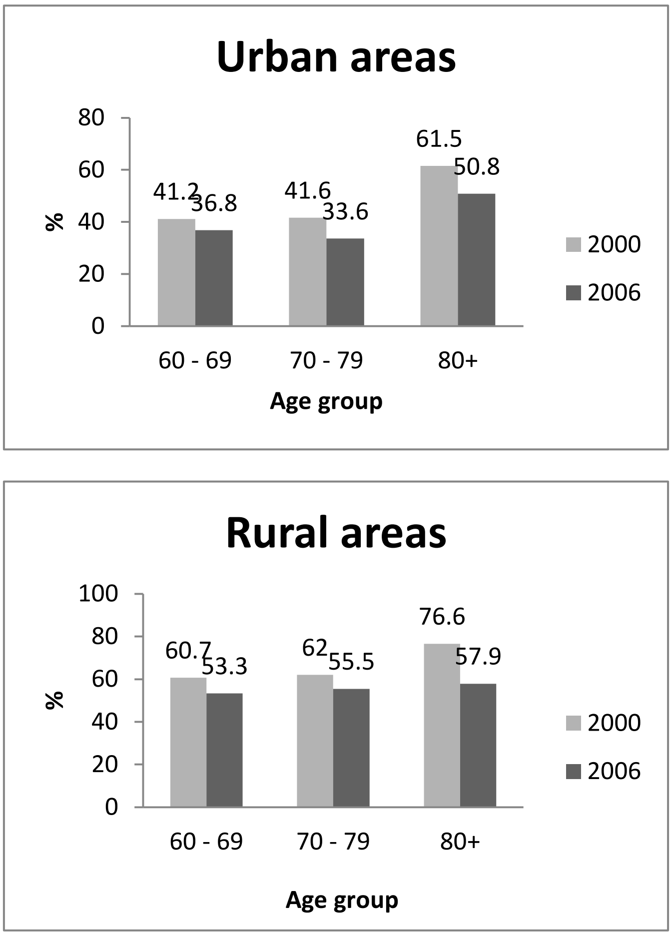
The surveys asked respondents whether they would like to live with their children ("Yes", "Indifferent" and "No"). The data suggests that older people do not show a great desire to live with their children. In general, the proportion of older people who would like to live with their children declined from 55.2% in 2000 to 42.8% in 2006, while the proportion of older people who were indifferent to the idea of living with their children increased by more than 8% between the two time points. This suggests that the preference for living with children decreases over time. A possible explanation is that as older people become more financially independent, and enjoy higher levels of property ownership, they are more capable of choosing their preferred living arrangements.

Figure 6.3: *Preference of co-residence by year*



The preference in terms of living arrangements for older persons in urban and rural areas is presented in Figure 6.3. In general, old parents in rural areas (e.g. 54.6% in 2006) showed a considerably greater desire to live with their children than their urban counterpart (e.g. 37.1% in 2006) in both years. By contrast, significantly more urban older people (e.g. 41.5% in 2006) than rural older people (e.g. 20.9% in 2006) did not want to live with their children. Comparing the preference for living arrangements in 2000 with that of 2006, older people in both areas experienced the same trend of change in attitude over the two periods: a fall in the percentage of older people who wanted to live with their children, an increase in proportion of older people who were indifferent to whether they lived with their children or not, and a slight decline in the share of older people who do not want to live with their children.

Figure 6.4: *Preference of living with children by age group*



The age pattern of preference for living with children confirms the time trend of old parents' changing attitude to living arrangements (Figure 6.4). For all age groups in either urban or rural areas, there are fewer old parents who want to live with children in 2006 than in 2000. This implies that the preference for living with children has been weakened over time for all age cohorts. In rural China, it is clear that the older the parents are, the greater their desire to live with their children. Such age patterns apply to the urban old parents as well. For example, in 2006, half of the urban oldest old wanted to live with their children - a markedly higher percentage than among members of the younger age cohort. The finding that the desire to co-reside with children increases with age is likely because children are considered as the providers of old-age support, older elderly parents who are more financially and instrumentally needy are thus more demanding of the care of their children. Alternatively, it may be because the older cohort value co-residing with their children as part of the traditional culture more highly than the younger cohort.

Furthermore, the question arises how old parents' preference for living with children meets the actual living arrangements. Tables 6.4 and 6.5 present the actual and preferred living arrangements of urban and rural old parents in 2006 respectively. In urban areas, the percentage of older people with unmet preferences was relatively low. For older people who already lived with their children, two thirds (61.6%) of them would like to live with their children, while only less than a quarter (20.9%) said they did not want to live with their children. For those who were not living with children, less than 20% of them (19.8%, 16% and 19.6% of those who lived alone, lived with a spouse and lived with grandchildren respectively) were unhappy with their current living arrangements; in other words, they would like to live with children.

Table 6.4: *Actual and preferred living arrangements of urban older people, 2006*

	Actual living arrangements			
Preferred living arrangements	Live alone	Live with spouse	Live with children	Live with grandchildren
Would like to live with children	19.8	16.0	61.6	19.6
So so	22.0	24.6	17.5	23.3
Would not like to live with children	58.2	59.4	20.9	57.1
N	1,244	3,726	4,358	464

Note: expressed as percentage, for example, first column first row indicates within those lived alone, 19.8% of them would like to live with children.

In rural areas, aside from those who co-resided with children, the proportion of older people with unmet preferences was remarkably high. Three quarters (74.8%) of co-resident respondents were happy with their living arrangements with children. However, 40.8%, 44.5% and 26.4% respectively of those who lived alone, lived with spouses, and lived with grandchildren, said they did not want to live with children. This means less than half of older people who were not living with children were happy with their living arrangements. Among those who were not living with children, older people who lived with grandchildren showed a significantly greater desire to co-reside with adult children than the other two groups. This is consistent with previous studies that indicate that grandparents become care providers for their grandchildren left behind in rural villages due to labour migration of their working-age children (Ke & Li, 2001; Silverstein, Cong *et al.*, 2006; Yang, 1996). Therefore, old parents in skipped-generational households are likely to be in special need and to look for assistance from children.

Table 6.5: *Actual and preferred living arrangements of rural older people, 2006*

	Actual living arrangements			
Preferred living arrangements	Live alone	Live with spouse	Live with children	Live with grandchildren
Would like to live with children	35.7	26.8	74.8	46.8
So so	23.6	28.7	16.4	26.8
Would not like to live with children	40.8	44.5	8.8	26.4
N	1,278	2,782	5,242	284

Note: expressed as percentage, for example, first column first row indicates within those lived alone, 35.7% of them would like to live with children.

Finally, among non-co-resident older people, those who lived with a spouse showed less desire to co-reside than older people who lived alone and those who lived with grandchildren. Such difference was found significant in rural areas, while it was found to be minor in urban areas. This implies that the spouse is an important source of care in old age. Consequently, those who lived with a spouse were less needy for children’s care. In rural areas, where social welfare is undeveloped, the spouse plays a more important role in care of older people than in urban areas, where other forms of substitute are easier to access.

6.3 Empirical results

6.3.1 Determinants of coresidence

Table 6.6: *Determinants of living with adult children for urban older people, 2006*

	(1) LP		(2) Logit		(3) LP		(4) Logit	
	Coe.	P-value	Coe.	P-value	Coe.	P-value	Coe.	P-value
Pension (000s)	0.00	0.14	-0.01	0.12				
1/4 quartile of pension					0.01	0.49	0.05	0.47
2/4 quartile of pension					0.00	0.82	0.02	0.77
3/4 quartile of pension					0.00	0.98	0.00	0.98
4/4 quartile of pension					-0.02	0.34	-0.09	0.33
Other pre-transfer incomes (000s)	0.00	0.18	0.00	0.21	0.00	0.16	0.00	0.19
Age	-0.09	0.00	-0.39	0.00	-0.09	0.00	-0.39	0.00
Age square	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Male	0.02	0.11	0.08	0.11	0.02	0.13	0.07	0.14
Widowed	0.15	0.00	0.63	0.00	0.15	0.00	0.64	0.00
Year of schooling	-0.00	0.02	-0.01	0.02	-0.00	0.02	-0.01	0.02
Party member	-0.02	0.05	-0.10	0.05	-0.02	0.04	-0.11	0.04
Difficulty in ADL	0.03	0.00	0.15	0.00	0.03	0.00	0.15	0.00
Number of children	0.00	0.46	0.01	0.43	0.00	0.41	0.01	0.38
Owns property	-0.02	0.04	-0.10	0.05	-0.03	0.03	-0.11	0.04
Has savings	-0.09	0.00	-0.38	0.00	-0.09	0.00	-0.38	0.00
R^2 or Pseudo R^2	0.076		0.068		0.077		0.067	
N	9746		9746		9746		9746	

Notes: (1) Provincial dummies are included but not reported.

(2) For this and all subsequent tables for multivariate regressions, the p-value indicates the significance level of an estimated coefficient. If the p-value of an estimated coefficient is less than or equal to 0.01, 0.05 and 0.1, such estimation is regarded as statistically significant at 1%, 5% and 10% level respectively.

This section analyses the determinants of parents' actual living arrangements. Whether an old parent lives with their children or not is affected by various factors. The usual predictors come from both parents' and children's sides: the financial and instrumental needs of old parents and the potential care giver's resources. Tables 6.6 and 6.7 show the determinants of co-residing with children using linear probability[82] (LP)

[82] In practice, a linear probability model implies running an OLS regression of binary choice as dependent variables. However, such regression may introduce two problems. The first one is the predicted probabilities could be outside the 0-1 interval indicating that the probabilities cannot be linearly related to the independent variables for all their possible values. Another problem is that it could produce heteroskedasticity in the residual variance (Wooldridge, 2003, p. 243).

and logit models. The aim of adopting two models is to seek to provide a more robust result. The dependent variable in these models is defined as a dummy variable, which equals to 1 if an old parent is co-residing with at least one adult child and equals to 0 if not. Independent variables include a series of demographic characteristics and economic conditions of old parents.

Table 6.7: *Determinants of living with adult children for rural older people, 2006*

	(1) LP		(2) Logit		(3) LP		(4) Logit	
	Coe.	P-value	Coe.	P-value	Coe.	P-value	Coe.	P-value
Pre transfer incomes (000s)	-0.001	0.148	-0.004	0.193				
1/4 quartile of pre transfer income					-0.031	0.853	-0.106	0.818
2/4 quartile of pre transfer income					0.032	0.847	0.080	0.861
3/4 quartile of pre transfer income					0.042	0.797	0.108	0.814
4/4 quartile of pre transfer income					-0.022	0.896	-0.071	0.877
Age	-0.046	0.000	-0.132	0.000	-0.044	0.000	-0.126	0.000
Age square	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000
Male	0.005	0.613	0.016	0.596	0.004	0.712	0.012	0.707
Widowed	0.122	0.000	0.345	0.000	0.123	0.000	0.351	0.000
Year of schooling	-0.003	0.071	-0.009	0.074	-0.003	0.098	-0.009	0.102
Party member	-0.001	0.968	0.003	0.948	-0.003	0.866	-0.004	0.922
Difficulty in ADL	0.082	0.000	0.241	0.000	0.080	0.000	0.236	0.000
Number of children	0.015	0.000	0.045	0.000	0.015	0.000	0.044	0.000
Owns property	-0.126	0.000	-0.354	0.000	-0.127	0.000	-0.357	0.000
Has savings	-0.052	0.001	-0.138	0.003	-0.051	0.002	-0.138	0.003
R^2 or Pseudo R^2	0.134		0.105		0.138		0.108	
N	9583		9583		9591		9591	

Note: provincial dummies are included but not reported.

Demographic characteristics of old parents such as age, gender and number of children are included in the regressions. Widowhood, difficulty in activities of daily living (ADL) are used to proxy care needs of old parents. Parents' economic needs are represented by incomes, education, party membership (a communist party membership usually indicates higher social and economic status), property ownership and saving for old age. It is possible that parental incomes have a non-linear relationship with coresidence. For example, for parents at low income level, those with lower income might be more likely to live with children because of a greater financial need. For wealthy parents, incomes may not have an effect on the decision of coresidence because parents are financially well-off. It is also possible that the interpretations of correlation between incomes and coresidence are different for parents at different income levels. For example, for parents at high income level, a positive correlation between incomes and coresidence may imply children's incentive to live with parents to obtain financial assistance. By contrast, a positive correlation between incomes and coresidence for parents at low income level may indicate parents' willingness to live with children to obtain financial help. To cover these possibilities, pre-transfer incomes are also modelled as a linear spline with three knot points. Models (1) and (2) assume a linear relationship between parents' pre-transfer incomes and co-residing, while models (3) and (4) allow for nonlinearities using a piecewise linear spline with knots at the 25th, 50th and 75th percentiles of all pre transfer income per older person. Moreover, to emphasise the impact of public transfer programmes, pre-transfer incomes for urban older people are divided into pension and other pre-transfer incomes from this section onward. While there is only a low proportion of rural older people who receive a pension, pre-transfer incomes for rural samples include all public and private transfers excluding transfers from children.

Neither model assuming linear or non-linear relationship finds a statistically significant relationship between contemporary pre-transfer incomes and the decision to co-reside. This absence of income effect on coresidence is not inconsistent with previous studies. For example, Jensen (2003) finds that in South Africa, parents' coresidence decision is not systematically related to their pension income. Analyses from Cai, Giles *et al.* (2006) do not find a statistically significant relationship between pension income and probability of coresidence in urban China. Lei, Strauss *et al.* (2011) failed to find a statistically significant correlation between parental incomes and coresidence in China. Such unresponsiveness of co-residence to pre transfer income may reflect the fact that the decision to co-reside may not be driven by the low income level of parents.

Conversely, both models find that the decision to co-reside responds to parents' economic status and accumulation of wealth. Old parents who are better educated (generally implying higher social and/or economic status), who are party members (generally considered as receiving higher retirement incomes than non-party members), who own a property, or have savings for their old age, are found to be significantly less likely to live with their children. This is true for both urban and rural samples. The finding of the unresponsiveness of co-residence to parental contemporary incomes does not necessarily contradict the finding of the responsiveness to parents' economic status. This may be because adult children generally know the magnitude of their parents' wealth better than their patents' contemporary income level.

The analysis also shows that in both urban and rural areas, old parents with more instrumental needs are more likely to live with their children. Marital status (widowhood) coded as one if a spouse is no longer alive, health condition measured by difficulty in ADL score[83], and age all have the anticipated effect on the probability of co-residence. The likelihood of co-residence decreases until the age of 73, and then begins to increase with age. Old parents are more likely to live with their children after a spouse passes away, or with a worse condition of health (indicated by positive estimates of difficulty in ADL coefficients). Moreover, old parents with more adult children are found to be more likely

[83] See chapter 3 for details.

to live with children, though the estimate is not significant for the urban samples. The fact that both the linear probability and logit regressions present similar statistically significant results confirms the robustness of the estimations.

6.3.2 Determinants of multiple living arrangements

The determinants of children's living distance from their parents are of interest because how far children live from their parents will influence the capacity of provision of help. In this section, a multinomial logit model is applied to investigate the multiple choices on living arrangements. The dependent variable in this section is a trichotomous variable which equals to 1 if an old parent is co-residing with at least one adult child, equals to 2 if an old parent has a closest child in the same city, and equals to 3 if an old parent has a closest child in another city. The living arrangement that parents have a closest child in another city is set as the base category in the multinomial logit regressions, and thus all the coefficients of such group are set to zero and not reported. The same explanatory variables used in the previous section are included in the regressions. As in the previous section, I allow for non-linearity of parental pre-transfer income. Model (1) assumes a linear relationship between parents' pre-transfer incomes and children's living distance from their parents, while model (2) allows for nonlinearities using a piecewise linear spline with knots at the 25th, 50th and 75th percentiles of all pre transfer income per older person. The multinomial logit coefficient estimates show the impacts of the explanatory variables on sorting into coresidence or having a closest child in the same city relative to having a closest child in another city.

Table 6.8: *Multinomial logistics regressions on living arrangements, urban 2006*

	(1)				(2)			
	Same household		Same city		Same household		Same city	
	Coe.	P-value	Coe.	P-value	Coe.	P-value	Coe.	P-value
Pension (000s)	-0.02	0.04	-0.02	0.10				
1/4 quartile of pension					0.31	0.23	0.25	0.32
2/4 quartile of pension					0.11	0.67	0.07	0.77
3/4 quartile of pension					0.15	0.60	0.13	0.64
4/4 quartile of pension					-0.18	0.53	-0.12	0.69
Other pre-transfer incomes (000s)	0.01	0.32	0.01	0.48	0.02	0.28	0.01	0.44
Age	-0.16	0.36	0.21	0.25	-0.18	0.31	0.19	0.28
Age square	0.00	0.49	0.00	0.24	0.00	0.43	0.00	0.26
Male	-0.08	0.62	-0.17	0.30	-0.10	0.54	-0.19	0.27
Widowed	0.41	0.05	-0.24	0.24	0.42	0.04	-0.23	0.26
Year of schooling	-0.05	0.01	-0.04	0.04	-0.05	0.01	-0.04	0.02
Party member	-0.05	0.78	0.06	0.74	-0.09	0.60	0.02	0.91
Difficulty in ADL	1.01	0.00	0.61	0.05	1.05	0.00	0.64	0.04
Number of children	0.54	0.00	0.55	0.00	0.55	0.00	0.55	0.00
Owns property	-0.15	0.43	-0.06	0.76	-0.19	0.34	-0.09	0.66
Has savings	-0.17	0.31	0.20	0.23	-0.20	0.24	0.18	0.29
Pseudo R^2	0.076				0.076			
N	9746				9746			

Note: provincial dummies are included but not reported.
Base group: those without any children in the same county.

Estimates of the multinomial logit coefficients are presented in Table 6.8 for urban samples. The effects of age, gender and party membership are not statistically significant. Owning a property or having private savings for old age have no significant effect either on the probability of coresidence or of living close by. Old parents with more children or more difficulties in ADL are more likely to live with an adult child or have an adult child close by. Widowed parents are more likely to live with their children. Education decreases the probability of coresidence and living nearby. An interesting finding is on the linear relationship between pension and children's living distance. Results from the last section do not find a significant effect of pension on whether a parent lives with children or not. However, a parent with higher pension income is found less likely to coreside (significant at 5% level) or have an adult child live nearby (though the coefficient is significant at 10% level), compared to having an adult child live far away. Other pre-transfer incomes do not have a significant effect on children's living distance.

Table 6.9 reports results for rural residents. Both linear and non-linear models show that pre-transfer income, age, gender and having private savings for old age do not have a significant effect on children's living distance to parents. Widowhood, education, functional limitation (measured by difficulty in ADL) and number of children have the same effects on choice of multiple living arrangements for rural old parents as for urban old parents. However, being a party member or owning a property reduce the probability of coresidence and living nearby for rural old parents.

Table 6.9: Multi-logistics regressions on living arrangements, rural 2006

	(1)				(2)			
	Same household		Same city		Same household		Same city	
	Coe.	P-value	Coe.	P-value	Coe.	P-value	Coe.	P-value
Pre transfer incomes (000s)	0.00	0.75	0.00	0.81				
1/4 quartile of pre transfer income					-12.07	0.04	-11.92	0.04
2/4 quartile of pre transfer income					-11.93	0.05	-12.08	0.04
3/4 quartile of pre transfer income					-11.92	0.05	-12.13	0.04
4/4 quartile of pre transfer income					-11.97	0.04	-11.86	0.04
Age	-0.09	0.57	0.16	0.33	-0.09	0.60	0.15	0.35
Age square	0.00	0.48	0.00	0.47	0.00	0.51	0.00	0.50
Male	0.17	0.27	0.15	0.35	0.17	0.29	0.15	0.35
Widowed	0.34	0.04	-0.25	0.14	0.35	0.04	-0.26	0.13
Year of schooling	-0.09	0.00	-0.08	0.00	-0.09	0.00	-0.08	0.00
Party member	-0.41	0.02	-0.46	0.01	-0.42	0.02	-0.47	0.01
Difficulty in ADL	0.38	0.09	0.02	0.93	0.38	0.09	0.01	0.98
Number of children	0.15	0.00	0.24	0.00	0.15	0.00	0.24	0.00
Owns property	-0.86	0.00	-0.29	0.06	-0.86	0.00	-0.29	0.06
Has savings	-0.05	0.83	0.18	0.39	-0.06	0.76	0.16	0.45
Pseudo R^2	0.118				0.121			
N	9492				9492			

Note: provincial dummies are included but not reported.

Base group: those without any children in the same county.

6.3.3 Impacts on intergenerational transfers

In this section, I examine the correlations between multiple living arrangements and intergenerational transfers. Intergenerational transfers are measured in two ways: 1) whether the parent receives a positive net transfer from adult children (receives a larger amount of money transfers than gives); 2) the amount of net transfers to parents. The net transfer amount is calculated as the amount given to children subtracted from the amount received from children. A logit model and an OLS regression are used to exam the effect of living arrangements on the incidence and the amount of net transfers respectively. Regressions using gross transfers as dependent variable are reported in Appendices 6.1 and 6.2. As in the last section, multiple living arrangements are a set of dummy variables for each distance to the closest living adult child. The omitted living arrangement is "currently living with children". The rest of living arrangements dummy variables indicates the following issues: 2 - Have a closest adult child living in the same county/city, 3 - Have a closest adult child living in another county/city. The main respondents whose adult children are all in other countries and those who do not have any child are dropped. Parents' pre-transfer income as well as the same socioeconomic and demographic characteristics that appeared in previous analyses are controlled for.

Columns (1) and (2) in Table 6.10 report the estimations on whether a parent receives net transfer from his/her children and on the amount of net transfers respectively for urban older people. The key findings in this section are the estimated effects of living arrangements. The incidence of receiving net transfers from children is positively related to children's living distance. Although the coefficient of "Has a closest child in other city" is not statistically significant, it could be explained by the small number of samples of this category of living arrangements. Compared to those coresiding with children, parents having a closest child living in the same city or parents having a closest child living in another city are more likely to receive net transfers from children. The estimation of the amount of net transfers implies the same influences of living arrangements. Both “Has a closest child in the same county” and “Has a closest child in another county” show a positive effect on the amount of net transfers that a parent receives. Therefore, parents living far away from adult children are predicted to be more likely to receive net transfers from children, and receive a larger amount conditional on the occurrence of net transfer. Other findings include negative effects of age, gender and property ownership on the probability of receiving net transfers, and the positive effects of age, widowhood, difficulties in ADL, number of children and having

Table 6.10: *Estimations of the incidence and amount of net transfers to old parents, urban 2006*

	(1) Received Net Transfers		(2) Amount of Net Transfers	
	Coe.	P-value	Coe.	P-value
Has a closest child in the same city	0.19	0.00	191.88	0.10
Has a closest child in another city	0.09	0.63	1068.68	0.06
Pension (000s)	-0.08	0.13	49.19	0.35
Other pre-transfer incomes	-0.01	0.24	37.28	0.23
Age	-0.15	0.01	-106.83	0.49
Age square	0.00	0.01	0.70	0.50
Men	-0.09	0.10	-281.66	0.10
Widowed	0.21	0.00	-97.11	0.59
Year of schooling	0.00	0.72	91.29	0.00
Party member	0.05	0.40	-198.90	0.31
Difficulties in ADL	0.21	0.00	-214.85	0.21
Number of children	0.15	0.00	79.32	0.13
Owns property	-0.13	0.02	46.67	0.78
Has savings	0.59	0.00	171.57	0.33
R^2 or Pseudo R^2	0.115		0.078	
N	8874		2859	

Note: provincial dummies are included but not reported.

Column (1) reports results from a logit model, with dependent variable=1 if a parent received net transfer, =0 if otherwise.

Column (2) reports results from an OLS model, with the amount of net transfers as dependent variable.

savings for old age on the likelihood of receiving net transfers from children. In this chapter, I only focus on the effect of living arrangements. For the other factors of the incidence and amount of net transfers, I will discuss in more detail in chapter 7.

Table 6.11: *Estimations of the incidence and amount of net transfers to old parents, rural 2006*

	(1) Received Net Transfers		(2) Amount of Net Transfers	
	Coe.	P-value	Coe.	P-value
Has a closest child in the same county	0.04	0.46	-59.41	0.09
Has a closest child in another county	0.25	0.09	306.85	0.10
Pre-transfer income	-0.06	0.16	93.85	0.40
Age	0.09	0.07	90.49	0.41
Age square	0.00	0.15	-0.59	0.42
Men	-0.20	0.00	64.85	0.57
Widowed	0.25	0.00	-79.50	0.49
Year of schooling	-0.02	0.08	29.73	0.16
Party member	0.00	1.00	269.63	0.09
Difficulties in ADL	0.08	0.02	-285.2	0.11
Number of children	0.13	0.00	81.43	0.01
Owns property	-0.17	0.00	-12.34	0.91
Has savings	0.03	0.72	449.22	0.01
R^2 or Pseudo R^2	0.096		0.083	
N	9262		5569	

Note: provincial dummies are included but not reported.

Column (1) reports results from a logit model, with dependent variable=1 if a parent received net transfers, =0 if otherwise.

Column (2) reports results from an OLS model, with the amount of net transfers as dependent variable.

The estimations on incidence and the amount of net transfers for rural older people are reported in Table 6.11. As seen from column (1), living far away from children increases the probability of receiving net transfers, though proximity to children does not have a significant effect on whether receiving net transfers or not. Given net transfers occurred, however, parents living in the same city as children are predicted to receive a lower amount of net transfer. Parents not living in the same city as their children are estimated to receive a larger amount of net transfers. Other factors have similar influences on the incidence and amount of net transfers as those for urban older people.

Although the evidence is weak (significant at 10% level), results from Table 6.11 suggest that instead of coresidence, living close to children reduces intergenerational transfers, while living far away from children strengthens intergenerational transfers from children to parents. This may be because in rural areas, inter-household transfers often take the form of labour input into family farming (Lee & Xiao, 1998), rather than giving money directly to the parents. Proximity to parents makes such indirect transfers easier, in which case children may reduce the direct financial support to parents. Table 6.12 shows that for those who owned land in rural areas, more than 60% of them had their adult children's help in cultivating. This should support the argument that children offer financial support thorough cultivating parents' land and explain the negative effect of proximity on children's financial transfers.

Table 6.12: *The percentage of rural older people who own land and whose children help cultivate their land*

	Yes
Do you own land?	74.42%
N	9640
	Yes
Do your children cultivate your land?	64.24%
N	7173

Source: calculations from FUSSAPUR.

6.4 Discussion

Population ageing and the modernisation process have taken place in China for decades, and will continue in the foreseeable future. On the one hand, there is little doubt that intergenerational relationships will be reshaped over time, especially in urban and industrial areas, preceding challenges to family support of old age. On the other hand, with its strong traditional culture based upon Confucian family values, China is likely to undergo a modernisation pathway different from what today's industrialised nations experienced. While China is establishing a functioning pension system, and adult children are the main care providers for ageing parents, these two factors have raised concerns about old-age support.

As noted by previous researches (Meng & Luo, 2008), I have found that older Chinese people are increasingly less likely to co-reside with children. This probably arises for two reasons. The first one is the diminishing number of children and the shrinking household size due to the dramatic decline in mortality and fertility. As indicated by the data, older households experienced a decrease in the number of children over the periods of 2000 and 2006. The second possibility is that attitudes on the part of parents have been changing. Descriptive statistics suggest that old parents do not show a great desire to live with children, and that a willingness to co-reside has been declining over time for all age cohorts.

Nevertheless, the statistics do not show evidence of change in living arrangements which leave older people isolated over time. On the one hand, co-residence is still prevalent in China, although the predominant pattern of living arrangement for older people in urban areas has switched from co-residence to living with only a spouse during these two time points. On the other hand, as an elderly adult gets older, he/she is less likely to live with children but more likely to have a child living nearby. Once an old parent becomes infirm (around 75), the older he/she is, the more likely he/she will co-reside with children, but the less likely they are to have a child living nearby. This implies that at least one adult child will return to the parental household to fulfil the obligation of taking care of parents.

The investigation of the determinants of older people's coresidence decision shows that older people with more financial or instrumental needs are more likely to live with children. Old parents whose spouse passed away or with more difficulties in ADLs are found to have a higher probability of co-residence. Having more surviving children is also associated with higher possibility of co-residence. Contrarily, old parents who are better educated (generally implying higher social and/or economic status), own a property or have savings for their old age are less likely to live with children. The analysis of determinants of living arrangements suggests that co-residence is an important source of old-age support in China.

My further investigation of the determinants of parents' living distance to children finds that in urban areas, old parents with a higher pension are more likely to live far away from children. However, the model does not find evidence that pre-transfer income has an effect on rural parents' multiple living arrangement choice. In urban and rural areas, significant evidence has been found that parents with more instrumental needs are estimated to be less likely to live far away from adult children. An important factor of living arrangements is the number of children. The models suggest that although it does not influence whether a parent lives with adult children or not, urban old parents with more children are less likely to live far away from children. For rural old parents, the number of children increases the probabilities of both coresidence and of living close to children.

The analyses of living arrangement's impacts on intergenerational transfers provide a complex picture. In contrast to previous studies (Lei, Strauss *et al.*, 2011), I do not find evidence that living arrangements have a negative effect on intergenerational transfers parents receive. In general, parents living far from children receive more intergenerational transfers. Compared to those co-residing with children, urban parents living close by or far away from their children are more likely to receive net transfers and to receive a larger amount of net transfers from children, despite the estimations are significant at 10% level. I also find weak evidence (significant at 10% level) for rural parents, that living farther from children increases the parents' probability of receiving net transfers. Although rural parents living close by are estimated to receive a smaller amount of net transfers, it is likely that proximity makes indirect transfers easier and reduces direct transfers.

To summarise, with the analysis of two nationally representative survey data, SSAPUR and FSSAPUR, this chapter illuminates the patterns of living arrangements and their impacts on intergenerational transfers. The results suggest that living close to children, rather than co-residing with them, has become an important way of providing old-age support. Such a trend of changes in living arrangements is likely to persist in the foreseeable future both because the number of children is an important determinant of coresidence and because of the significant reduction in the number of children per family as a result of demographic transition. However, such changes in living arrangements do not necessarily constrain intergenerational transfer capacity and make old parents worse-off. Non-resident children have a greater responsibility to provide more financial support in order to compensate for their absence. As a result, living close to children rather than coresidence with them does not necessarily weaken the family-based financial support mechanism. The family unit and traditional family support in old age seem likely to continue to be the essential pillars of old-age security, particularly in rural areas.

Appendix 6.1: *OLS regressions of the incidence and amount of gross transfers to parents, urban 2006*

	Received Gross Transfers		Amount of Gross Transfers	
	Coe.	P-value	Coe.	P-value
Has a closest child in the same city	0.14	0.00	220.37	0.09
Has a closest child in other city	-0.04	0.80	1107.8	0.02
Pre-transfer incomes	-0.04	0.00	27.23	0.00
Age	-0.18	0.00	-87.64	0.53
Age square	0.00	0.00	0.53	0.57
Male	-0.19	0.00	-209.3	0.16
Widowed	0.19	0.00	-93.27	0.55
Year of schooling	0.00	0.57	89.83	0.00
Party member	-0.01	0.81	-120.6	0.47
Difficulties in ADL	-0.08	0.22	-64.33	0.72
Number of children	0.17	0.00	67.11	0.15
Owns property	-0.16	0.00	44.78	0.76
Has savings	0.60	0.00	265.74	0.08
R^2	0.101		0.071	
N	9715		3471	

Note: provincial dummies are included but not reported.

Appendix 6.2: *OLS regressions of the incidence and amount of gross transfers to parents, rural 2006*

	Received Gross Transfers		Amount of Gross Transfers	
	Coe.	P-value	Coe.	P-value
Has a closest child in the same county	-0.01	0.92	-55.70	0.60
Has a closest child in other county	0.19	0.21	328.78	0.26
Pre-transfer incomes	-0.05	0.00	89.50	0.00
Age	0.09	0.07	70.53	0.51
Age square	0.00	0.13	-0.46	0.52
Male	-0.19	0.00	64.65	0.56
Widowed	0.22	0.00	-84.93	0.45
Year of schooling	-0.01	0.14	33.66	0.10
Party member	-0.01	0.91	253.23	0.10
Difficulties in ADL	0.06	0.32	194.71	0.14
Number of children	0.12	0.00	77.59	0.01
Owns property	-0.17	0.00	-6.04	0.95
Has savings	0.07	0.34	466.79	0.01
R^2	0.090		0.068	
N	9470		5808	

Note: provincial dummies are included but not reported.

Chapter 7: How do intergenerational transfers respond to parental income?

From reviewing the literature we know the importance of distinguishing altruism and exchange transfer motives and estimating the crowding-out effect of public transfers. It was demonstrated that accurately estimating the transfer derivative[84] is the key to distinguishing between altruism and exchange motives; a negative transfer derivative is consistent with both altruism and exchange theories, while a positive association is consistent only with the exchange theory. This is especially crucial in China because of its rapidly ageing population and the on-going expansion of the public social security sector. Crucially, establishing whether public transfer will crowd out private transfer would be an indispensable prerequisite in being able to design an effective pension system in China and other developing countries.

However, not all of the previous work from China has been able to explicitly test the effect of the social insurance programme and old-age pensions on private transfers[85]. For example, the key independent variable in Lee and Xiao's (1998) analyses was all pre-transfer income of old parents including social insurance programmes, friends and relatives' transfer, while other studies (e.g., Cai et al. 2006) focused on all pre-transfer incomes of households, including all family members. To investigate the potential crowding-out or crowding-in effect of public transfers, pre-transfer income for older people in urban areas is divided into pension and non-pension pre-transfer income, in which case I am able to explicitly estimate the impact of pension on children's transfers to old parents.

[84] Recall in chapter 2, the transfer derivative indicates how much private transfers change as the income of the recipient increases.
[85] See section 2.3.2 in chapter 2 for details.

This chapter aims to examine the determinants of intergenerational transfers, and, more importantly, to estimate the transfer derivatives, from the perspective of old parents who received positive net transfers (of either cash or in-kind support in cash value) from children. Net transfer is equal to the transfer received minus the transfer given. A positive net transfer indicates that one receives a larger amount of monetary transfers than the amount he or she gives. This chapter will highlight the problems inherent in empirically testing the crowding-out hypothesis, and how my quantitative methods can help to circumvent some of these difficulties and, in the process, obtain more robust results. The empirical analysis in this chapter is divided into two parts. Firstly, I will look at the incidence of receiving net transfers and their determinants. Secondly, I will study how these determinants influence the size of transfers conditional on a net transfer occurring.

To meet these goals, the rest of this chapter is organised into four main sections. Section 7.1 will provide a statistical description of the main variables used in the following empirical modelling. Section 7.2 will discuss the statistical difficulties in identifying the relationship between parents' pre-transfer income and children's transfer and propose possible solutions. Section 7.3 will present the results from the empirical analysis of factors affecting the incidence of receiving private transfers. Section 7.4 will present the results from analysis of factors affecting the amount of transfers parents received, with a focus on the transfer derivatives. The last section offers a conclusion for the chapter.

7.1 Descriptive statistics[86]

[86] For the definitions of variables, please see Section 5.2 of Chapter 5.

7.1.1 Characteristics of old parents

This section outlines characteristics of old parents along three axes: demographics, health and socioeconomic status (SES). Figure 7.1 shows that 75.7% of men and 48.3% of women are married; 19.6% of men and 49.3% of women are widowed; 2.6% of men and 2.3% of women are divorced; and 2.1% of men and 0.2% of women are single (never married). In terms of location variations, 67.9% of urban residents and 57.4% of rural residents are married; 29.3% of urban residents and 38.2% of rural residents are widowed; 2.3% of urban residents and 2.5% of rural residents are divorced; and 0.4% of urban residents and 2% of rural residents are single.

Among married people, there is a significantly larger proportion of men than women. This is not unexpected, as it mainly reflects the age difference at marriage – men tend to marry younger women. This automatically increases the proportion of women who are widowed, as their partners would, on average, be older than them, and also because life expectancy among women is higher than that among man. The percentage of women who are widows is more than twice the percentage of men who are widowers. The differences are very clear for all age groups, and are particularly pronounced for young and middle age groups. There is not much difference between men and women in the proportion of divorced individuals. The proportion of single older people is very low for both men and women and is more concentrated in the younger male group (2.7%).

Figure 7.1: *Marital status by age for men, women, urban and rural older people, 2006*

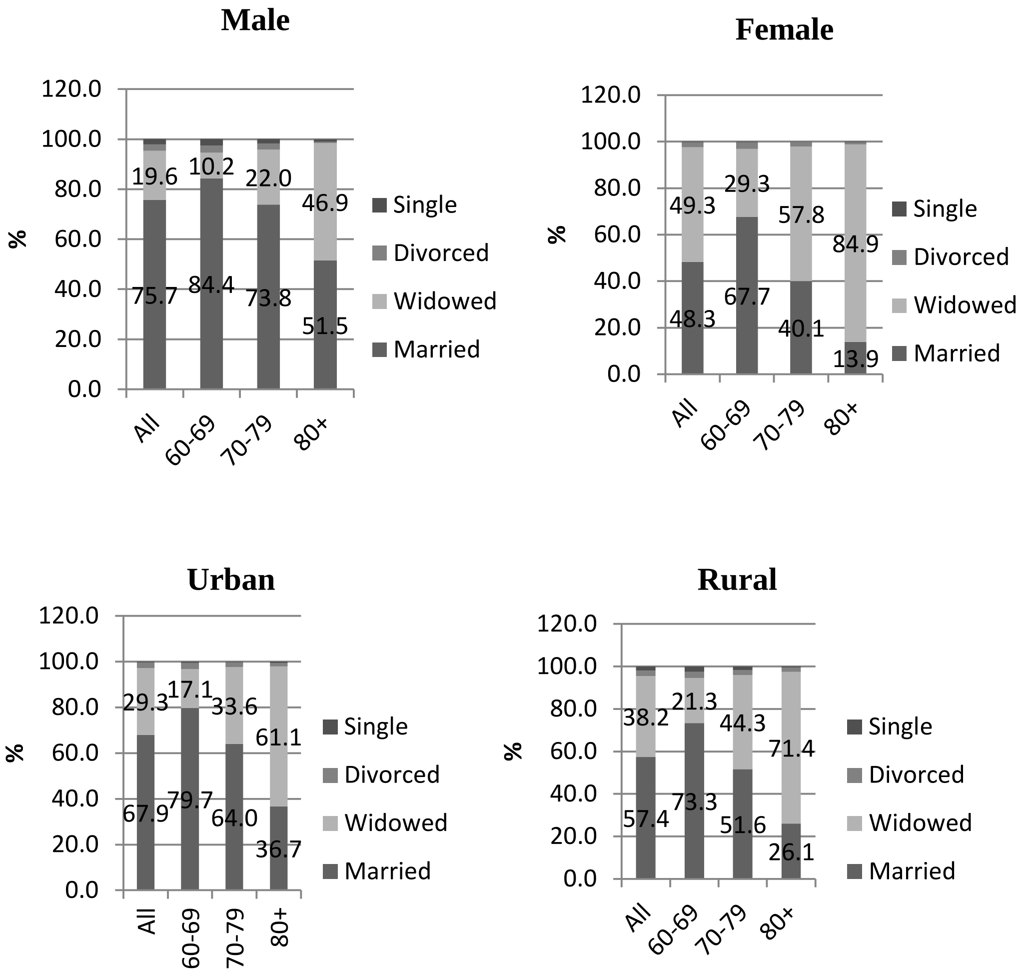


Table 7.1 presents the health condition of older people using the three measurements of health (self-rated health status, the index of difficulties with activities of daily living and whether respondents had some particular chronic disease) discussed in chapter 5. In general, the health condition of older persons decreased with age, with older cohorts more likely to report feeling poor health, more difficulties in ADL and higher chance of getting a major disease. Moreover, urban older people reported a higher self-rated health and lower ADL difficulty, indicating the former were generally healthier. The statistics show a higher proportion of urban older people getting major illnesses than rural older people, which is surprising. However, a previous study (Lei, Giles *et al.*, 2012) using CHRLS found the same urban-rural chronic disease disparity. This could be because of the poor

medical care in rural China, meaning that older people have less chance to see a doctor. The low ratio is likely to reflect the fact that many older persons with major illnesses were not diagnosed.

Table 7.1: *Health status of urban and rural older people by age group, 2006*

	Urban areas			Rural areas		
Age group	(1)	(2)	(3)	(1)	(2)	(3)
All	3.05	19.83	38.07	2.91	21.87	23.22
60-64	3.22	17.31	29.31	3.11	18.60	18.34
65-69	3.13	18.17	36.87	3.02	19.86	21.74
70-74	3.07	19.34	40.06	2.92	21.33	25.07
75-79	2.90	21.53	42.35	2.78	23.66	26.06
80+	2.79	26.25	43.60	2.61	28.43	25.78

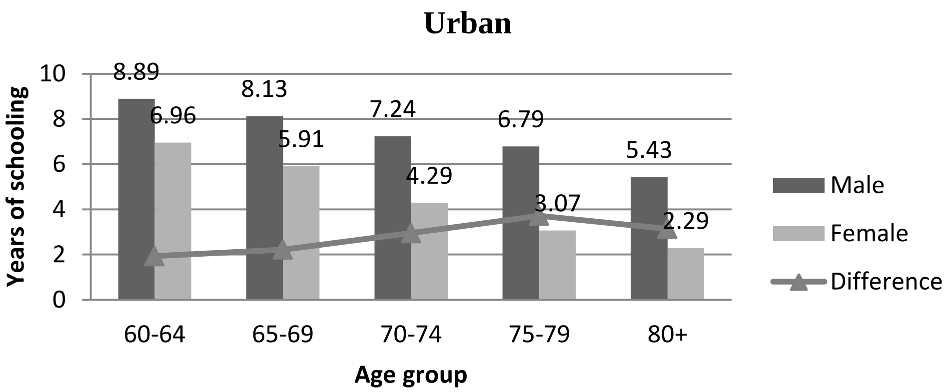
Note: column (1), (2) and (3) show the mean values of self-rated health condition, index of difficulty in ADL and the probability of getting a major chronic disease, respectively.

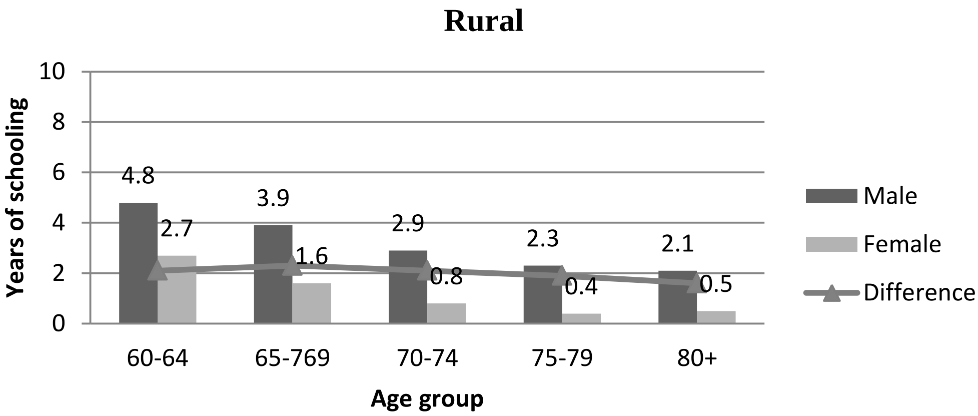
Table 7.2: *The percentage of samples with different educational level by living location and gender, 2006*

	All	Urban	Rural	Male	Female
	%	%	%	%	%
Illiterate	35.82	21.49	50.29	20.96	52.22
Sishu	4.24	2.92	5.57	5.67	2.66
Elementary school	32.14	30.33	33.95	37.86	25.82
Middle school	14.63	20.83	8.38	18.32	10.55
High school	8.34	15.21	1.42	10.30	6.18
College and above	4.74	9.17	0.28	6.75	2.53

Most of the respondents had not achieved a middle school or above qualification, including 40% of them having had no education or little informal education (*Sishu*) and 32.1% of them having only completed elementary education (Table 7.2). Conversely, only 4.5% of respondents had achieved a high educational qualification of college and above. This is not unexpected for people of these age groups. It is clear that urban and male respondents respectively have achieved a higher educational level than rural and female respondents. For example, people with no education are the largest group for rural respondents (50.3%) and women (52.2%). By contrast, urban older people are much more likely to finish middle (20.8%), high school (15.2%) and college (9.2%) than rural older people (8.4%, 1.4% and 0.3% respectively); men are much more likely to finish elementary school (37.9%), middle school (18.3%), high school (10.3%) and college (6.75%) than women (25.8%, 10.6%, 6.2% and 2.5% respectively).

Figure 7.2: *Average number of years of schooling by gender and age group, 2006*





Looking across age groups for both living locations and for both sexes, it is clear that younger respondents have received more years of schooling than older ones (Figure 7.2). This should be due to the resumption of college entrance examination in 1977 and since then the expansion in education attendance in the late 1970s as a consequence of the introduction of nine-year compulsory education. Furthermore, the slope of increasing average years of schooling with decreasing age is steeper for women than men. For example, women aged 60-64, 65-69, 70-74, 75-79 and over 80 in urban areas received 7 , 5.9, 4.3, 3.1 and 2.3 years of education respectively. Although men received more years of education than women at all ages, this differential shrank with decreasing age for urban older residents (but not for rural ones). This implies older women are getting better educational opportunities, especially in urban areas.

Table 7.3: *Working status of urban older people, 2006*

Work status	Percentage	Ownership of work unit before retired	Percentage
Retired	74.86	GNI	26.03
Working	0.41	SOE	53.45
Never worked	20.61	UCE	16.72
Others	3.61	Private	1.12
Missing	0.51	Other work unit	2.55
		Missing	0.12
Number of case	10,016	Number of case	7,498

Note: see Appendix 3.1 for definitions of the work unit ownerships.

Table 7.3 shows that in 2006, three quarters of the urban samples had officially retired and one fifth of them had never worked (e.g. housewives or disabled), while only less than 0.5% of respondents reported they were still officially working. Because respondents in the samples were aged 60 and over, this is consistent with the mandatory retirement age of 60 for men and 55 for women in China. For those officially retired, most of them had worked in the public sector before retirement, while only 1% of them reported that they had worked in private firms before retirement. This is consistent with China's economic development pathway that state-owned enterprises and urban collective enterprises used to be the most important part of the economy and were employing the majority of the urban work force until the reform policy in the 1980s.

The questionnaires also asked if respondents were involved in any paid work, and whether they were willing to take a paid job. This does not contradict the question relating to working status shown in Table 7.3, because an individual could have a paid job after retirement. An example is when a doctor officially retires from a hospital at the age of 60, but is re-hired by a private school as a health advisor. Information from 2000 and 2006 is presented in Table 7.4 for the urban older persons and in Table 7.5 for the rural older persons to the time trend of willingness of work. In 2006, there were only 5.9% of respondents in cities who had a paid job. Although the majority of the urban respondents did not want to have a paid job, the proportion of respondents in cities who were willing to work (20.2%) was much higher than the proportion of respondents who actually had a paid job (5.9%). From 2000 to 2006 the proportion of older people who had a paid job, or who were willing to have a paid job, dropped by 4% and 11.6%, respectively. By contrast, the proportion of rural older people who were still farming was a lot higher than the proportion of urban older people who had a paid job. This proportion slightly increased from 44.3% in 2000 to 45.5 % in 2006. Moreover, the proportion of rural older people that said they were not willing to farm rose from 48% in 2000 to 90.3% in 2006. The fact that the high actual labour participation rate contrasts with the extremely low level of willingness implies that the rural older persons were working under duress.

Table 7.4: *Actual and preferred work decisions of urban older people, 2000 and 2006*

	Whether had a paid job now			Whether willing to have a paid job			
Year	Yes	No	Total	Yes	So so	No	Total
2000	9.6	90.49	100	31.8	10.3	57.9	100
2006	5.9	94.1	100	20.2	12.3	67.5	100

Table 7.5: *Actual and preferred work decisions of rural older people, 2000 and 2006*

	Whether farming			Whether willing to or were able to farm		
Year	Yes	No	Total	Yes	No	Total
2000	44.3	55.7	100	52.0	48.0	100
2006	45.5	54.5	100	9.7	90.3	100

Note: the 2000 questionnaire asked rural respondents whether they were willing to farm, while the 2006 questionnaire asked rural respondents whether they were able to farm.

The change in work status and willingness to work indicates that, on the one hand, more Chinese in cities are willing and able to enjoy life in old age because of higher incomes from the improving pension system. On the other hand, the fact that there were more older people willing to work than the number of those who were actually able to get a job, shows that there is still a financial need and desire to work. Conversely, the rural older people were more likely to be pressurised into work by both low income levels and an undeveloped pension system in rural China.

Table 7.6 and Table 7.7 present the annual income and its composition of older individuals by age group and by gender in urban and rural areas, respectively. In general, urban residents and men received a higher total income than rural residents and women respectively. In 2006, the average aggregate income for older people living in cities was 11,585 *Yuan* (approximately US$1,430), similar to the average per capita disposable income of urban citizens (11,320 *Yuan*) (NBSC, 2006). This is not surprising, because urban areas in the survey exclude towns and suburbs of towns, where incomes are generally lower than in cities. Among this figure, men had an aggregate income of 14,581 *Yuan* (US$1,800) and women had an aggregate income of 8,493 *Yuan* (US$1,049). By contrast, older people in rural areas had a much lower annual income: 2,987 *Yuan* (US$369) for men and 2,011 *Yuan* (US$248) for women.

Table 7.6: *Distribution of annual income of the urban older people by gender, 2006*

Men	All		60-69		70-79		80+	
	NO.	Composition	NO.	Composition	NO.	Composition	NO.	Composition
Market	1082.8	7.43%	1619.5	11.08%	717.6	4.90%	399.3	2.82%
Pension	12024.1	82.46%	11268.8	77.10%	12609.4	86.10%	12688.5	89.52%
Public	409.8	2.81%	426.5	2.92%	410.8	2.80%	336.4	2.37%
Private	640.0	4.39%	709.5	4.85%	585.2	4.00%	582.6	4.11%
Other	424.8	2.91%	591.8	4.05%	321.7	2.20%	167.9	1.18%
Total	14581.4	100.00%	14616.1	100.00%	14644.7	100.00%	14174.6	100.00%
N	4843		2145		2177		521	
Women	All		60-69		70-79		80+	
	NO.	Composition	NO.	Composition	NO.	Composition	NO.	Composition
Market	336.3	3.96%	429.3	4.75%	271.7	3.24%	213.6	3.11%
Pension	6618.5	77.93%	7156.5	79.26%	6571.1	78.24%	4829.7	70.34%
Public	407.0	4.79%	373.8	4.14%	400.8	4.77%	547.4	7.97%
Private	844.0	9.94%	832.0	9.22%	800.0	9.53%	1033.0	15.05%
Other	287.1	3.38%	237.6	2.63%	354.7	4.22%	242.1	3.53%
Total	8492.9	100.00%	9029.3	100.00%	8398.3	100.00%	6865.8	100.00%
N	4692		2141		1959		592	

In cities, pensions were the most important source of income for those aged 60 and over, accounting for 82.5% and 77.9% of total income of older men and women respectively. The other two main sources of income for older people include market income and family transfer, with varying importance for each gender group: men received 7.3% of their income from the market, 4.4% from family transfers; women received 4% of their income from the market, 9.9% from family transfers. In rural areas, the main sources of income included market incomes, pensions and family transfers. Market incomes, i.e. agricultural incomes, accounted for more than one third of the income of the rural older persons, with a slightly higher proportion for women than for men. While in rural areas older men received more pension incomes (26.84% of total incomes) than women (14.71% of total incomes), private transfers were more important for women (28.32% of total incomes) than for men (19.05% of total incomes).

Table 7.7: *Distribution of annual income of the rural older people by gender, 2006*

Men	All		60-69		70-79		80+	
	NO.	Composition	NO.	Composition	NO.	Composition	NO.	Composition
Market	1029.2	34.46%	1237.8	39.66%	902.0	30.65%	683.2	25.90%
Pension	801.5	26.84%	741.1	23.74%	860.1	29.23%	831.7	31.53%
Public	221.9	7.43%	165.5	5.30%	257.6	8.75%	311.2	11.80%
Private	568.9	19.05%	488.0	15.64%	615.9	20.93%	710.5	26.94%
Other	364.9	12.22%	489.0	15.66%	307.3	10.44%	100.9	3.83%
Total	2986.5	100.00%	3121.4	100.00%	2942.9	100.00%	2637.6	100.00%
N	5289		2442		2174		673	
Women	All		60-69		70-79		80+	
	NO.	Composition	NO.	Composition	NO.	Composition	NO.	Composition
Market	793.3	39.45%	870.9	41.30%	726.7	38.12%	768.7	37.82%
Pension	295.9	14.71%	306.6	14.54%	266.4	13.98%	343.7	16.91%
Public	144.9	7.20%	114.2	5.41%	154.7	8.12%	196.5	9.67%
Private	569.5	28.32%	531.2	25.19%	591.1	31.01%	610.3	30.03%
Other	207.5	10.32%	286.0	13.56%	167.4	8.78%	113.4	5.58%
Total	2011.1	100.00%	2108.9	100.00%	1906.3	100.00%	2032.6	100.00%
N	4186		1733		1760		693	

However, the importance of pension incomes in rural areas was possibly overestimated in Table 7.7, because only 5% of the rural older people received pensions in 2006. For these 5% receiving persons, the pension benefits they received were relatively high compared to the average incomes for other rural-based older people. The high proportion of pensions making up total incomes comes from the relatively high pension incomes of these 5%. Moreover, many of those receiving a pension had an urban *hukou,* and were likely to be migrants in old age: having moved from urban to rural areas when they aged. Since older persons with an urban *hukou* who lived in rural areas had a more "urban" income composition, I present another table to show income component of rural older persons by restricting samples to individuals living in rural areas holding rural *hukou* only (Table 7.8). Excluding those with urban *hukou,* pensions make up the smallest proportion of total income (8.21% for men and 1.77% for women), while market incomes and family transfers become the most and second most important source of income.

Table 7.8: *Distribution of annual income of the rural older people with rural hukou by gender, 2006*

Men	All		60-69		70-79		80+	
	NO.	Composition	NO.	Composition	NO.	Composition	NO.	Composition
Market	1064.2	44.01%	1258.7	49.10%	952.9	40.84%	713.7	33.03%
Pension	198.5	8.21%	164.2	6.41%	204.7	8.78%	303.1	14.03%
Public	212.8	8.80%	159.1	6.20%	245.1	10.50%	304.5	14.09%
Private	584.4	24.17%	496.3	19.36%	635.7	27.24%	740.3	34.26%
Other	358.2	14.81%	485.3	18.93%	294.8	12.64%	99.2	4.59%
Total	2418.0	100.00%	2563.5	100.00%	2333.2	100.00%	2160.9	100.00%
N	4895		2270		2000		625	
Women	All		60-69		70-79		80+	
	NO.	Composition	NO.	Composition	NO.	Composition	NO.	Composition
Market	835.9	47.37%	910.2	49.29%	770.0	45.70%	815.0	46.31%
Pension	31.3	1.77%	15.9	0.86%	32.1	1.91%	68.6	3.90%
Public	117.6	6.66%	91.6	4.96%	126.8	7.53%	160.5	9.12%
Private	578.1	32.76%	542.1	29.36%	600.8	35.66%	612.2	34.79%
Other	201.7	11.43%	286.6	15.53%	155.2	9.21%	103.6	5.89%
Total	1764.6	100.00%	1846.4	100.00%	1684.9	100.00%	1760.0	100.00%
N	3907		1632		1639		636	

Regarding age patterns, for urban old men, pensions increase both in amount and importance with age, while family transfers decrease both in amount and importance with age. For example, urban-based old men aged 60-69 received, on average, pension (family transfers) of 11,268 (710) *Yuan,* which accounted for 77.1% (4.9%) of total income, compared with those aged 80 and over, who received an average pension of 12,689 (583) *Yuan,* which accounted for 89.5% (4.1%) of total income. For rural old men, regardless of whether restricting samples into individuals with a rural *hukou* or not, income compositions exhibited the same age pattern for rural older people: while market incomes decrease both in amount and importance with age, both family transfers and pensions increase in amount and importance with age.

Although it is less clear, the age pattern for older women implies similar responses for family transfer on pension or total income. For older women, family transfers form a larger part of total income when pensions become a smaller share, and the amount of total income becomes smaller. For example, urban women aged 60-69 received total incomes of 9,029 *Yuan*, of which 79.3% and 9.2% respectively came from pensions and family transfers; urban women aged 70-79 received total incomes of 8,398 *Yuan* of which 78.2% and 9.5% respectively came from pensions and family transfers; urban women aged 80 and over received total incomes of 6,866 *Yuan* of which 70.3% and 15.1% respectively came from pensions and family transfers.

7.1.2 Patterns of transfers[87]

This thesis analyses monetary transfers from the perspective of old parents, so the amount of net transfers is defined as transfers received from children subtracting transfers given to children. I evaluate both the amount of transfers and their incidence to investigate the magnitude and prevalence of transfer flow between parents and children. Recall from chapter 5, we need to bear in mind that intergenerational monetary transfers in this study indicate transfers between parents and all their adult children, rather than transfers between each parent-child pair in some previous studies (e.g., Chan, 2011; Lei,

[87] In this section, those with no children (351 samples in 2000 and 419 samples in 2005) are dropped. And the highest 0.1% (actually for transfer to parents, drop greater than 30000) of amount of transfer are dropped to reduce biases from occasional lump-sum payments (e.g. parents paying for wedding or housing).

Giles *et al.*, 2012). In addition, average transfer amounts in this section were calculated conditional on transfer occurring, and are larger than the average private transfers in Table 5.1 and Table 5.2 which were not calculated conditional on occurrence of transfer.

Table 7.9: *Transfer pattern by living location and age group, 2006*

	Children to parents					
	Incidence (%)			Amount among receivers/givers (*Yuan*)		
	All	Urban	Rural	All	Urban	Rural
All	47.7	34.9	60.7	1150	1781	782
60-64	42.6	32.3	52.2	1290	2074	834
65-69	45.0	32.6	59.2	1239	1945	797
70-74	47.6	34.5	61.9	1144	1735	786
75-79	50.8	35.6	65.9	1145	1555	769
80+	56.7	44.3	66.7	990	1507	712
	Parents to children					
	Incidence (%)			Amount among receivers/givers (*Yuan*)		
	All	Urban	Rural	All	Urban	Rural
All	12.8	18.7	6.8	3247	3935	1316
60-64	15.4	21.6	9.5	4153	5130	2079
65-69	13.9	19.6	7.2	3121	3794	1022
70-74	12.8	18.6	6.5	2973	3528	1256
75-79	11.5	18.2	4.8	3001	3571	846
80+	8.5	12.8	5.1	2562	3440	769
	Net receivers					
	Incidence			Amount among receivers/givers (*Yuan*)		
	All	Urban	Rural	All	Urban	Rural
All	46.4	32.2	59.8	1119	1758	744
60-64	40.5	29.2	50.5	1265	2033	807
65-69	43.2	29.5	58.0	1225	1935	781
70-74	46.6	32.4	60.9	1119	1703	758
75-79	49.9	32.6	65.9	1098	1518	719
80+	55.9	42.4	66.0	976	1484	704

Table 7.9 presents the monetary transfer pattern in 2006. Overall, familial intergenerational transfers are pervasive in China, with about a half (47.7%) of Chinese old parents having received monetary transfers from children in 2006. More specifically, a significantly higher proportion of old parents in rural areas received monetary transfers from children (60.7%) than that of old parents in urban areas (34.9%). Conditional on those who received children's transfers, however, the average amount urban parents received (1,781 *Yuan*) is more than twice that received by rural parents

(782 *Yuan*). Moreover, the proportion of old parents receiving children's transfers increases with age, while the average amount old parents received decreases with age. This is very clear for all age groups in both urban and rural areas. For example, 32.3% (52.2%) of urban (rural) parents aged 60-64 received transfers, with an average amount of 2,074 (834) *Yuan*; 34.5% (61.9%) of urban (rural) parents aged 70-74 received transfers, with an average amount of 1,735 (786) *Yuan*; 44.3% (66.7%) of urban (rural) parents aged 80 and over received transfers, with an average amount of 1,507 (712) *Yuan*.

By contrast, downward transfers to children are not very common, with a 12.8% prevalence rate for all old parents in 2006. The statistics show a clear pattern for all age groups: urban parents are more likely to give and give more money than rural parents; younger parents are more likely to give and give more money than the older ones. For example, 21.6% (9.5%) of urban (rural) parents aged 60-64 gave transfers, with an average amount of 5,130 (2,079) *Yuan*; 18.6% (6.5%) of urban (rural) parents aged 70-74 gave transfers, with an average amount of 3,528 (1256) *Yuan*; 12.8% (5.1%) of urban (rural) parents aged 80 and over gave transfers, with an average amount of 3,440 (769) *Yuan*. The average amount of downward transfers is significant larger than upward transfers.

Comparing the transfer pattern in 2006 (Table 7.9) with that in 2000 (Table 7.10) allows me to analyse how familial intergenerational transfer changes over time. Over this period, upward transfer has become slightly less prevalent. For instance, the proportion of parents receiving transfers from children has declined by about 4% (comparing 34.9% to 38.5%) and 5% (comparing 60.7% to 65.3%) in urban and rural areas respectively. This time trend of decline in incidence of receipt of transfers applies to all age groups. Considering the downward transfers, however, the data show different patterns for urban and rural older persons. Urban parents have been slightly more likely to give, while rural parents have been slightly less likely to give financial transfers to children.

Table 7.10: *Transfer pattern by living location and age group, 2000*

			Children to parents			
		Incidence (%)		Amount among receivers/givers (*Yuan*)		
	All	Urban	Rural	All	Urban	Rural
All	51.8	38.5	65.3	980	1143	699
60-64	45.9	32.7	60.1	1185	1744	837
65-69	50.0	36.5	64.4	1004	1436	738
70-74	54.2	41.6	66.8	924	1362	648
75-79	59.0	44.9	71.0	778	1162	570
80+	61.9	52.1	69.6	782	1195	535
			Parents to children			
		Incidence (%)		Amount among receivers/givers (*Yuan*)		
	All	Urban	Rural	All	Urban	Rural
All	14.1	17.5	10.1	2836	3802	1205
60-64	16.9	20.6	12.7	3421	4391	1614
65-69	15.1	18.4	11.6	2915	3837	1357
70-74	12.3	15.6	9.0	2446	3492	636
75-79	11.1	13.4	9.2	2039	3175	647
80+	9.2	12.4	6.7	1275	1505	939
			Net receivers			
		Incidence		Amount among receivers/givers (*Yuan*)		
	All	Urban	Rural	All	Urban	Rural
All	48.7	35.2	62.1	963	1131	679
60-64	42.3	29.1	57.2	1161	1707	820
65-69	46.6	33.0	60.8	982	1401	721
70-74	51.6	38.8	64.1	913	1341	642
75-79	56.5	42.7	68.2	769	1145	564
80+	59.3	48.9	67.3	770	1171	526

7.1.3 Patterns of filial piety

It is widely believed that modernisation and its consequences, secularisation and individualism, have caused a decline in filial piety in Western countries (Aboderin, 2004). In China, the debate about whether the modernisation process has brought about erosion of filial piety and of financial support to old parents has attracted widespread interest (Cheung & Kwan, 2009; Whyte, 2003; Zhan, 2004a; Zhan, 2004b). Although the relationship between modernisation and filial piety is difficult to test empirically (mainly because modernisation is a multi-dimensional concept and is difficult to measure), it is generally agreed that given other conditions are unchanged, children with stronger filial piety are more likely to give financial support to their parents, and vice versa. In this section, I present a preliminary analysis of the trend of filial piety in China using descriptive statistics of the two datasets.

Table 7.11: *The percentage of respondents who felt their children were filial*

	All	Urban areas	Rural areas
	%	%	%
2006	73.65	78.62	68.58
2000	76.18	78.97	73.33

Note: calculations from the SSAPUR and FUSSAPUR

The survey asked respondents "generally speaking, how filial you think your children are" (very filial, filial, so so and not filial). The percentage of respondents who felt their children were "very filial" or "filial" is shown in Table 7.11. In general, about three quarters of older Chinese people thought their children were filial toward them. The statistics also show that a higher proportion of urban older people (78.62% and 78.97% in 2006 and 2000 respectively) considered their children as filial, compared with those in rural areas (68.58% and 73.33% in 2006 and 2000 respectively). Between 2000 and 2006, slightly fewer Chinese older people thought that their children were filial. Such a fall comes mainly from the reduction among the rural older people of those who felt that their children were filial. This contradicts common perceptions that agrarian and traditional societies have relatively high filial piety because of economic and social underdevelopment, stronger traditional values, and fewer interactions with Western culture. Respondents were also asked whether they agreed with the old Chinese saying that "by the bedside of the chronically sick, there is no dutiful son". Agreeing with such saying should indicate a relatively low level of feeling of children's filial piety, while disagreeing should indicate the converse. Table 7.12 presents the proportion of respondents that disagreed with this Chinese saying, which should reveal parents' feelings with respect to their children's filial piety. The statistics demonstrate neither that rural older people had a stronger feeling of children's filial piety than their urban counterparts, nor that they felt that the values associated with filial piety had become undermined between 2000 and 2006.

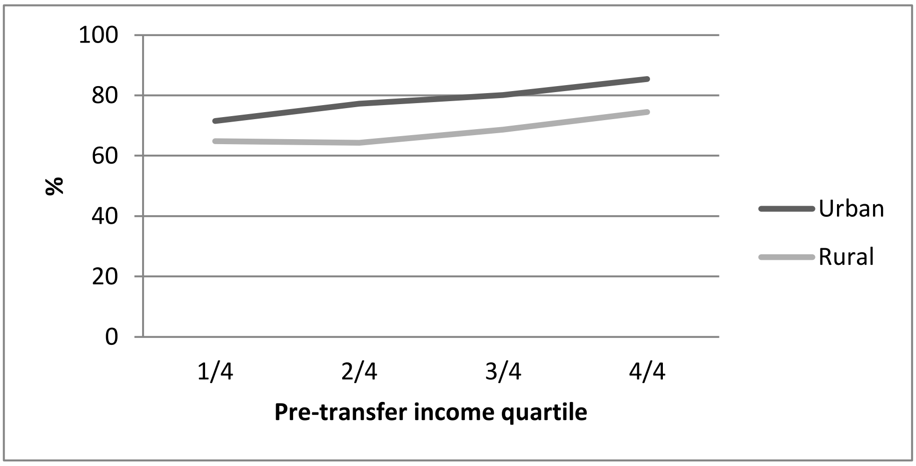
Table 7.12: *The percentage of respondents who disagreed with the saying "by the bedside of the chronic sick, there is no dutiful son"*

	All	Urban areas	Rural areas
	%	%	%
2006	23.51	23.34	23.68
2000	31.17	31.62	30.71

Note: calculations from the SSAPUR and FUSSAPUR

I also present the proportion of respondents who reported that their children were filial by respondents' pre-transfer income levels (1st quartile, 2nd quartile, 3rd quartile and 4th quartile of pre-transfer income). Figure 7.3 shows that the proportion of old parents who reported their children were filial increases with their pre-transfer income. These differences in self-rated filial piety of children for different pre-transfer income groups are significant in both urban and rural areas. It implies that wealthier parents are more likely to feel their children are filial towards them.

Figure 7.3: *The percentage of respondents who felt their children were filial by pre-transfer income quartile, 2006*



Although there is no information on adult children, this section shows that, from the parents' view, there is no evidence that filial piety has been undermined over time. At least, there is no evidence that parents felt filial piety had been weakened over time. Moreover, the data does not show evidence of a stronger filial piety in rural areas than in urban areas. This may be because the actual practice of filial piety not only requires an ideological or attitudinal basis, but also material resources. It is likely that the increases in economic resources and education brought about by modernisation may strengthen the ability to practise filial piety and may neutralise its negative effect on filial piety.

7.2 Statistical issues

Before heading forward to the empirical results, it is important to highlight some statistical issues of modelling the relationship between parental income and private transfers. To address how responsive private transfers are to recipient income, I have presented several theoretical models to estimate both linearity and nonlinearity. In practice, various characteristics on the individual level are included in the regressions as determinants of transfer occurrence and transfer amounts (for details of measurements of variables, please see Chapter 5). I include age and age square of respondents to control for the life-cycle effects. The gender (Men=1, Women=0) and marital status (Widowed=1) of respondents are included to capture financial needs. In fact, most previous studies found that private transfers are disproportionately targeted to women (e.g. Cox, 1987; Cox, Eser *et al.*, 1998; Cox, Hansen *et al.*, 2004; Lucas & Stark, 1985). The index of difficulty in ADL with a higher score indicating worse health condition, and a dummy variable indicating an individual has any chronic illness are included to control for health status.

The key variable in this analysis is pre-transfer income calculated as the sum of incomes from all sources except for private transfers[88]. For urban respondents, I separate pension incomes from non-pension incomes to emphasise the importance of public transfers for private transfers. Because pension incomes account for a very small portion of pre-transfer incomes for rural respondents (only 5% of them received pensions), it makes no sense to separate them. I also include years of schooling to capture human capital and permanent income effects. Whether a respondent owned a property and the amount of personal savings are included to capture possible wealth effect on transfers. Retirement benefits (besides pension), such as health insurance and housing allowance, vary according to the ownership of work units before retirement. I then divide respondents' working status into several categories to capture the effect of unobserved retirement benefits. The reference group is those who were not working and did not qualify for any pension. The questionnaire asked different questions for respondents in urban and rural areas. In urban areas, other categories include: respondents who were still working in formal sectors; self-employed; as well as those retired from: government institutes (GNI), state-owned enterprises (SOE), collective-owned enterprises, private firms and other work units. In rural areas, other categories include farming and those officially retired from formal work.

I also control for the number of children and household size. Provincial dummies are, in that sense, indicators of different family norms, economic and welfare system development. The final two variables I control for are dummy variables indicating whether respondents helped with babysitting grandchildren and their children's housework. Babysitting grandchildren or helping with housework can be seen as services provided by old parents, and depend largely on the geographic proximity between parents

[88] Recall from Chapter 5, pre-transfer income includes pension incomes and other public assistance, market incomes (which includes wages, salaries, and profits from farming and other self-run businesses), and property income such as interest and rent.

and children. In Chapter 6, I have shown that more than 95% of respondents had at least one child living in the same city or village, which makes providing such services geographically feasible.

Estimating the relationship between pre-transfer income and net transfer, however, is not always straightforward. Difficulties in identification could arise from the theoretical models or shortcomings of the dataset. Selection bias is one of the most often discussed. Parents may not be randomly assigned but self-select (both by themselves and children) as a net recipient. If we assume the transfer decision and the decision on transfer amount were separate, unobserved characteristics that affect transfer decision may also have an impact on the transfer amount. For example, the generosity of adult children has a positive effect on both the transfer decision and the amount of transfer given once the transfer decision has been made. Because estimations of transfer amounts include samples who were net recipients, ignoring the selection process may bias our results. The Heckman (1979) two-stage procedure is a widely-used method to correct for such selection bias, and has been applied in several other empirical studies on intergenerational transfer in China (e.g. Chan, 2011; Lee & Xiao, 1998). The use of the Heckman two-stage procedure includes a first stage probit regression of the incidence of receiving a positive net transfer, and a second stage of OLS regression of the amount of net transfers. The estimated residual from the first stage regression is then included in the second stage regression to control for selection bias.

It should be noted that a major drawback in using the Heckman model is to fulfil the exclusion restriction to produce valid results. In theory, an exclusion restriction means that at least one extra variable should be included and contribute to a significant coefficient in the first step probit regression but not in the second step OLS regression. In practice, however, it is difficult to find such variables affecting the possibility of receiving a positive net transfer, without any impact on the amount of transfers received. This is particularly difficult because in this study, whether an old parent is a net recipient or not is calculated from the amount of net transfers. It is nearly impossible to identify a factor affecting the incidence of receiving a positive net transfer that does not also affect the amount of net transfer. A failure to satisfy the exclusion restriction may produce some other problems. Therefore, in this thesis, I have decided to ignore any potential selection bias.

Many previous studies have assumed that non-public pre-transfer income (pre-transfer incomes exclude public transfers) is exogenous. However, non-public pre-transfer income may be endogenous with the labour supply decisions of parents, and may not be exogenously assigned to respondents. Indeed, parents may respond to children's characteristics of general supporting by raising the reservation wage in their job search (in other words, they are not willing to stay or re-enter the labour force). This implies that causality would be reversed and that pre-transfer income would be corrected with the residual terms in the equation (1) in chapter 5. Put differently, the decision to work may be related to unobservable factors that have an impact on the generosity of adult children and thus the amount of transfer that children can give, in which case the coefficient on pre-transfer income would suffer from an upward bias. Alternatively, if adult children believe that a low income parent is not looking hard enough for employment, they may offer less monetary transfer. Since the unobservable has a negative effect on children's transfer, the transfer derivative in this case suffers from a downward bias.

The dataset I used in this study covers individuals aged 60 and over. Considering the legal retirement age for men is 60 and for women is 55, such potential endogeneity of non-public pre-transfer incomes should be minimized in urban areas where most older people are engaged in wage-employment. The 2006 survey, for example, shows that 75% of samples reported they had officially retired from a formal job and 20% reported they never had a job, for whom the decision to work did not apply. Only less than 5% of samples engaged in self-employment, leaving endogeneity of the decision to work on pre-transfer income negligible. However, pre-transfer incomes of old parents in rural areas may suffer from the above-mentioned endogeneity because they are free to make the decision to farm or not at any age.

One last potential endogeneity that hampers the identification of transfer derivatives comes from living arrangements. The decision to co-reside with old parents may itself reflect a net transfer to or from the adult child. For example, in the case of adult children living in the parental household, implicit transfers include either children buying food or paying utility bills or parents offering free accommodation. However, neither the cash values of food and bills nor cash values of housing are observed in the survey. Moreover, if the decision to live with old parents is to support them or to "curry favour" in order to assure a generous inheritance, co-residence itself reflects altruism or exchange-based transfer motives. Analysis from chapter 6 found that co-residence responds to the financial or instrumental needs of old parents. Therefore, co-residence is likely to be correlated with the residual term in equation (1) in chapter 5 and bias the estimated coefficient. Since there is no way to "instrument" for the decision on living arrangements, I decided to exclude samples of parents that co-resided with children in order to remove endogenous bias from living arrangement. Descriptive statistics for all the aforementioned determining variables are reported in Appendices 7.1 and 7.2 with restriction of parents not living with children.

7.3 Factors determining the incidence of financial support from children

The dependent variables in this section are the incidence of old parents receiving from children a larger amount of financial transfer than the amount parents gave (Yes=1, No=0). Moreover, if the amount the parents gave to their children was the same or larger than the amount they received, then the net amount received is considered zero and the incidence of receiving support is coded as zero. A positive estimate of the explanatory variable implies such variable increases the probability of receiving a net transfer from adult children, and *vice versa*.

Table 7.13: *Logistic regression of incidence of positive net transfer, urban areas, 2006*

	Coe.	P-value
Age	-0.130	0.128
Age 2	0.001	0.121
Men	0.008	0.915
Widowed	0.276	0.002
Number of children	0.193	0.000
Number of unemployed children	-0.130	0.000
Number of children in other city	0.066	0.109
School year	0.024	0.298
School year square	-0.001	0.315
(never worked omitted)		
Have a formal job	-1.677	0.040
Self-employed	0.414	0.027
Retired from GNI	-0.618	0.000
Retired from SOE	-0.647	0.000
Retired from Collective	-0.451	0.001
Retired from private	-0.794	0.041
Retired from other sector	0.275	0.241
Pension/1000	-0.055	0.000
Other pre transfer/1000	-0.018	0.037
Owned properties	0.031	0.636
Savings/1000	0.006	0.000
Chronic disease	0.171	0.059
Difficulty in ADL	0.164	0.045
Help take care kids	0.159	0.083
Help housework	0.011	0.918
Provinces	yes	
Pseudo R^2	0.133	
N	4876	

Note: provincial dummies are included but not reported.
The Pseudo R^2 is McFadden's R^2 and is reported by Stata automatically.

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Table 7.13 presents the result of the logistic regression for old parents in urban areas. It shows that intergenerational transfers in urban areas respond to parents' financial need. Old parents who receive more pensions or have more other pre-transfer incomes are less likely to receive net transfers from their adult children. Additionally, the significant negative effect of pensions (-0.055) is larger than that of other incomes (-0.018). The results also show that intergenerational transfer in urban areas is targeted to old parents who have limited access to public resources[89]. Compared to those not working and ineligible for pensions (as is the case with housewives), old parents working in formal sectors, and those retired from government institutes, state-owned enterprises, collective-owned enterprises or private enterprises, are less likely to receive net transfers from children. Among these estimates, "still working in formal sectors" has the largest significant negative effect. Recall that in China, especially prior to the period of reform and opening up, government institutes provide more retirement benefits than state-owned enterprises and collective-owned enterprises, whereas private firms generally offer much less retirement resources than public sector counterparts. In contrast, parents that are self-employed and ineligible for pensions are more likely to receive net transfers. This should not indicate that net transfer is positively correlated with the decision to work. Instead, it should imply that net transfer is driven by low income of self-employed older people. This is because in China, it is not likely that a worker in a formal sector will turn to self-employment before retirement. Rather, it is more likely that an individual will remain self-employed until his/her retirement, or engage in self-employment after retiring from a fixed wage employment. Therefore, self-employment should reveal the decision to

[89] Parents that work in the public sector may expect greater retirement benefits and may have given less to children if they expected to rely less on children later in life. If this is the case, a negative probability of receiving from children does not imply a need-based transfer motivation. However, we should notice that this is not likely to happen in China, where individuals that have worked in public sectors use "*dingti*" (meaning replacement) options to transfer their job positions to their adult children (Li & Xiao, 1998) and old parents still rely on children for emotional assistance which work units cannot provide.

work in terms of whether it was driven by a lack of public resource and low income. The findings of significant coefficients of working status should indicate the effects of nonmonetary resources that various occupational groups of retirees had access to, given that monetary income is controlled in the regressions.

If transfer is altruistically motivated, even if parents have low contemporaneous income, one may observe a lower probability of net transfers if children recognise that their old parents have sufficient accumulated wealth to support themselves in old age. Nevertheless, the logistic model shows that the possibility of receiving net transfer is positively associated with parents' savings and the ownership of property, although the latter is not statistically significant. The positive signs of saving and ownership of property may imply a long term exchange-based transfer motive. In other words, adult children give money because they expect bequest or financial support from their parents.

Apart from socioeconomic variables, demographic and health characteristics of parents are also significant in affecting the probability of receiving transfers. Widowed parents are found to be more likely to receive net transfers. Indeed, widowed parents may need more time-related care rather than money transfers. Therefore, when old parents are in an unfortunate marital status (widowed or divorced), adult children tend to live with them to provide care[90]. As far as samples not living with adult children are concerned, the positive sign of widowhood is likely to be because children tend to give more financial support to compensate for lack of instrumental and time-related care. Not surprisingly, having a larger number of surviving children is related to higher probability of transfer occurrence, even controlling for health and pre-transfer income. On the one hand, more children means a larger total transfer amount that parents will receive, given that all other conditions are unchanged. On the other hand, children tend to transfer more frequently to

90 This conjecture has been confirmed by the findings in chapter 5: widowed elderly parents are more likely to co-reside with adult children.

parents if they are in competition with their siblings, but at the same time if they share the burden of support, this may lead to fewer transfers per capita. Unfortunately, the dataset does not allow me to identify which child transfers money and the relationship between the number of siblings and the amount of transfer given by each child. In contrast to the above, old parents with more unemployed children are less likely to receive monetary transfers from their adult children. Old parents that have more difficulties in undertaking daily activities or that have a major chronic disease[91] are more likely to receive transfers in urban areas. This further supports the hypothesis of need-based intergenerational transfers.

The insignificance of coefficients on ages, age squared, gender, years of schooling and year of schooling squared in urban areas reveal that parents' age and gender generally do not affect the incidence of transfers when taking into account income and health. Maybe it is because parents' health declines as they age, thus requiring more medical or instrumental care, paid for or provided by the adult children. This is supported by the findings in chapter 6 that co-residence which should imply more instrumental care from adult children becomes more prevalent when parents grow old.

Table 7.14 presents the results of the logistic regression for old parents in rural areas. Contemporary pre-transfer income and working status are found to have the same significant effect on the incidence of receiving net transfers in urban areas. Old parents with higher pre-transfer incomes are less likely to receive net transfers from their adult children. Additionally, old parents that have retired from a formal job (usually with better retirement benefits) or those are still farming are less likely to be a net recipient than those who are not farming and do not qualify for pensions. By contrast, widowhood, having more adult children or babysitting grandchildren increases the probability of receiving

[91] For details of how major chronic disease is defined, please see Chapter 5.

transfers from adult children. For the other variables, although they have the same signs as those in the urban regression, they are not statistically significant. The insignificance of age, gender and health-related variables may reveal that children tend to live with frail parents to provide instrumental assistance rather than give monetary support in rural areas. This is consistent with what I have found, namely that old parents with more serious ADL difficulties are more likely to live with children (see Tables 6.6 and 6.7 in chapter 6). Currently, older people in rural China have relatively little time to accumulate savings and lack land wealth. Given this, it is reasonable that one does not observe significant estimates of wealth-related variables.

Table 7.14: *Logistic regression of incidence of positive net transfer, rural areas, 2006*

	Coe	P-value
Age	0.001	0.995
Age 2	0.000	0.884
Men	-0.108	0.179
Widowed	0.144	0.092
Number of children	0.135	0.000
Number of children in other city	0.029	0.171
School year	0.020	0.539
School year square	-0.001	0.691
(never worked omitted)		
Still farming	-0.419	0.000
Retired	-1.260	0.000
Pre transfer income/1000	-0.020	0.066
Owned properties	0.020	0.768
Savings/1000	-0.003	0.593
Chronic disease	0.090	0.237
Difficulty in ADL	-0.008	0.913
Help take care kids	0.196	0.011
Help housework	-0.027	0.743
Provinces	yes	
Pseudo R^2	0.119	
N	4169	

Note: provincial dummies are included but not reported.
The Pseudo R^2 is McFadden's R^2 and is reported by Stata automatically.

7.4 Factors determining the amount of financial support from children

In this section, I will focus analysis on the transfer amount received by old parents. I include only those samples that received a positive net transfer, where the dependent variable is the amount of net transfer received from all adult children. The main focus of the analysis here is the transfer derivative that indicates how much the transfer amount changes in response to one unit increase in pre-transfer income.

Table 7.15: *OLS regression of net transfer amount, urban areas, 2006*

	Coe	P-value
Age	-191.4	0.45
Age 2	1.18	0.48
Men	260.41	0.32
Widowed	147.21	0.65
Number of children	99.08	0.05
Number of unemployed children	-88.51	0.06
Number of children in other city	297.40	0.03
School year	-149.5	0.05
School year square	13.44	0.01
(never worked omitted)		
Have a formal job	-1065.8	0.73
Self-employed	277.28	0.57
Retired from GNI	27.71	0.96
Retired from SOE	-335.31	0.41
Retired from Collective	423.22	0.32
Retired from private	-1125	0.40
Retired from other sector	-465.9	0.46
Pension/1000	27.14	0.36
Other pre transfer/1000	-8.52	0.78
Number of owned properties	552.49	0.01
Savings/1000	23.65	0.00
Chronic disease	143.94	0.63
Difficulty in ADL	-47.13	0.86
Household size	260.43	0.16
Help take care kids	76.54	0.79
Help housework	-6.50	0.99
Provinces	yes	
R^2	0.114	
N	1569	

Note: provincial dummies are included but not reported.

The sources of variation in net receipt are shown in Tables 7.15 and 7.16, which report the results of OLS regression of equation (2) in chapter 5 that apply the same independent variables as the estimation of incidence. Significant effects on the transfer amount are found only in a few variables. In urban areas, net transfer is negatively associated with the parents' years of schooling, with an increasing rate. One more year of schooling reduces transfer from children by 149.5 *Yuan*. This may be because better educated parents are more financially capable and are less needy. Alternatively, it may reinforce the modernisation argument that better educated parents have lower traditional expectations and less financial need (or parents signal less financial need to children). As expected, having children that are unemployed reduces the amount of transfer parents received, whereas parents that had more children working in other cities received more monetary transfers. In rural areas, old parents who were still farming received much less transfer (300 *Yuan*) than those not working. Because I have controlled for incomes, such significant negative effect should reveal the negative effect of parents' signalling of less financial need, rather than the effect of a genuine financial need. In other words, children expected farming parents simply have less financial need and therefore decided to give less to their parents.

Table 7.16: *OLS regression of net transfer amount, rural areas, 2006*

	Coe	P-value
Age	43.68	0.46
Age 2	-0.29	0.46
Men	48.63	0.38
Widowed	52.25	0.42
Number of children	31.23	0.05
Number of children in other city	73.45	0.00
School year	1.88	0.94
School year square	3.20	0.21
(never worked omitted)		
Still farming	-300.0	0.00
Retired	148.95	0.34
Pre transfer income/1000	3.85	0.29
Number of owned properties	-22.67	0.61
Savings/1000	19.04	0.00
Chronic disease	-19.62	0.71
Difficulty in ADL	-213.2	0.00
Household size	159.56	0.00
Help take care kids	59.56	0.27
Help housework	64.14	0.26
Provinces		
R^2	0.148	
N	2446	

Note: provincial dummies are included but not reported.

However, most estimates including the key variables "pension" or "pre-transfer income" are not statistically significant. For the purpose of testing the transfer motive, the results do not seem to support either the altruistic motive or the exchange motive. Instead, the results may reveal the co-existence of altruism and exchange motives. Because transfer derivative varies across parents' income level, the linear model is not able to capture the relationship between pre-transfer income and transfer. Instead, the insignificance may arise from the small sample size as I have excluded samples that did not receive a net transfer and who lived with children. I make use of the two waves of surveys firstly by pooling the 2000 and 2006 datasets in order to increase sample size and secondly by using the panel nature that included respondents from both years.

Table 7.17: *Linear regressions of net transfer amount using pooling data, urban areas*

	OLS		2SLS	
	Coe	P-value	Coe	P-value
Pension	0.04	0.01	0.17	0.06
Year 2006	445.41	0.00	186.34	0.43
Age	-109.8	0.43	-156.2	0.28
Age 2	0.62	0.51	0.93	0.34
Men	-29.22	0.85	-177.5	0.33
Widowed	-180.2	0.24	-174.3	0.26
Number of children	71.78	0.11	89.57	0.06
Number of unemployed children	-85.68	0.02	-66.93	0.08
Number of children in other city	212.30	0.00	190.06	0.00
School year	-69.26	0.10	-66.71	0.11
School year square	6.98	0.01	5.12	0.10
(never worked omitted)				
Have a formal job	1197.59	0.39	1884.36	0.20
Self-employed	484.99	0.07	568.27	0.04
Retired from GNI	-458.31	0.15	-1906.8	0.07
Retired from SOE	-362.69	0.10	-1182.34	0.05
Retired from Collective	94.23	0.68	-494.75	0.29
Retired from private	-844.8	0.21	-1352.5	0.08
Retired from other sector	-574.67	0.16	-973.34	0.05
Other pre transfer	0.02	0.34	0.01	0.37
Saving	0.02	0.00	0.02	0.00
Owned properties	145.29	0.29	124.22	0.37
Difficulty in ADL	-265.55	0.15	-256.40	0.16
Help take care kids	148.82	0.32	189.07	0.21
Help housework	-139.74	0.32	-166.51	0.24
Provinces	Yes		Yes	
Underidentification test			0.00	
Sargan test			0.21	
R^2	0.10		0.08	
N	3052		3052	

Note: provincial dummies are included but not reported.

Table 7.18: *Linear regressions of net transfer amount using pooling data, rural areas*

	Coe	P-value
All pre transfers	0.01	0.25
Year 2006	219.52	0.00
Age	-12.17	0.76
Age 2	0.06	0.82
Men	11.39	0.77
Widowed	-79.47	0.05
Number of children	36.37	0.00
Number of children in other city	80.47	0.00
School year	22.13	0.17
School year square	1.32	0.45
(never worked omitted)		
Farming	-225.20	0.00
Retired from formal sector	63.66	0.50
Saving	0.01	0.00
Owned properties	-24.18	0.49
Difficulty in ADL	118.35	0.03
Help take care kids	18.36	0.62
Help housework	40.45	0.27
Provinces	yes	
R^2	0.13	
N	4051	

Note: provincial dummies are included but not reported.

Let us concentrate on results using the pooling data from the 2000 and 2006 datasets, which are shown in Tables 7.17 and 7.18. The second column of Table 7.17 presents the results of an OLS regression, and the fourth column presents results of the 2SLS regression of equation (3) in chapter 5. I also include a year dummy variable (2006=1, 2000=0) to control for any year fixed effects. I find that either estimates of pension or all pre-transfer income in urban areas are statistically significant and have a positive effect on the amount of transfer received. The result from the 2SLS estimation is significantly positive, with a larger magnitude than the OLS estimate. Moreover, the reported under-identification and over-identification test both indicate the instrument variables are valid. However, the estimate of pre-transfer income in rural areas is not statistically significant.

In the analysis using panel data, it will be recalled that the dependent variables are the change in net transfer between the periods of 2000 and 2006. Because change in the pension received may be endogenous, I apply the 2SLS methods to reduce potential bias.

I used pension expenditure per capita at provincial levels in 2000 and 2006 to instrument change in pension. Such pension expenditure per capita is calculated from the *China Statistics Yearbook* for years 2000 and 2006. Table 7.19 presents the OLS and 2SLS estimations of equation (4) in chapter 5 in urban areas. Two models in urban areas present different results of the impact of change in pension on change in transfer. On the one hand, the OLS regression of urban areas shows that change in pension has a statistically significant negative effect (-0.06) on change in children's transfer. On the other hand, I found a statistically significant and positive estimated coefficient of change in pension (0.20) in the 2SLS regression. Again, both the reported under-identification and over-identification test indicate the instrument variables are valid. This implies the 2SLS estimated coefficient of change in pension is more reliable. Results of the OLS estimation of equation (4) in chapter 5 in rural areas, of which the key independent variable is change in all pre-transfer income, are shown in Table 7.20. However, I do not find a statistically significant impact of change in pre-transfer income in rural areas.

Table 7.19: *Linear regression of change in net transfer amount using panel data, urban areas*

	OLS		2SLS[92]	
	Coe	P-value	Coe	P-value
Change in pension	-0.06	0.00	0.20	0.07
Change in other income	-0.01	0.48	-0.01	0.31
Change in health condition[93]	-12.38	0.90	10.64	0.92
Change in savings	0.00	0.32	0.00	0.84
(All below variables are values in 2000)				
Age	-22.88	0.94	-534.27	0.12
Age square	0.13	0.95	3.59	0.13
School year	-10.95	0.86	-90.31	0.19
School year square	5.74	0.17	4.22	0.34
male	287.26	0.22	47.72	0.86
widowed	-186.75	0.46	-64.63	0.81
Number of children	-88.09	0.21	-43.98	0.57
Province	yes		No	
Underidentification test			0.00	
Sargan test			0.31	
R^2	0.03		0.05	
N	2670		2670	

Note: provincial dummies are included but not reported.

92 Instrument variables are average pension expenditure at provincial level in 2000 and 2006.
93 It is measured by the change in the score of difficulty in activities of daily living.

Table 7.20: *Linear regression of change in net transfer amount using panel data, rural areas*

	Coe	P-value
Change in all pre transfer	0.01	0.31
Change in health condition[94]	3.87	0.91
Change in savings	0.00	0.45
(All below variables are values in 2000)		
Age	-147.72	0.18
Age square	1.03	0.18
School year	20.97	0.50
School year square	-0.60	0.85
male	-48.98	0.55
widowed	-72.81	0.37
Number of children	15.16	0.47
Province	Yes	
R^2	0.02	
N	3833	

Note: provincial dummies are included but not reported.

R-square alone is simply a measure of the error in the regression over the total regression and only tells how much of the error is explained by the model. A low R-square may be due to the fact that there is a large amount of noise present in the model fitted, and given the data constraint one cannot capture these unexplained variances. In Table 7.19 and 7.20, the R-squares for the models fitted to explain how change in pension (and change in pre-transfer income) is related to change in children's net transfers are low, it may be because much of this noise can be explained by some other time-variant variables (such as change in children's earning capacity) that were not collected in the data. However, the p-value and the magnitude of the estimates of change in pension indicate that pension is still an important determinant for intergenerational transfer in urban areas even if the R-square for the model is low.

Finally, I present the results from estimation of equation (5) in chapter 5. Figure 7.4 shows the semi-parametric relationship between net-transfer and pension in urban areas, from which we can see a smooth U shape estimated correlation. Moreover, after removing the outer layers (the top 5% of net transfers and the top 1% of pension in Figure 7.2), a clearer pattern is obtained and presented in Figure 7.5. Children's transfer is

[94] It is measured by the change in the score of difficulty in activities of daily living.

negatively associated with parents' pension up to and around the level of annual pension of 5,000 *Yuan*. Then children's transfer goes up rapidly as pension increases until the level of annual pension of 10,000 *Yuan*. Above the pension of 10,000 *Yuan*, children's transfers slightly increase with parents' pension incomes. The estimated relationship between pre-transfer income and pension is consistent with that proposed elsewhere (Cox, Hansen *et al.*, 2004) and demonstrated in Figure 5.2. However, the semi-parametric estimation of transfer derivative for rural old parents is not clear, though it looks to gradually decrease with parents' pre-transfer incomes (Figure 7.6).

Figure 7.4: *Non parametric relationship between net transfer and pension, urban areas*

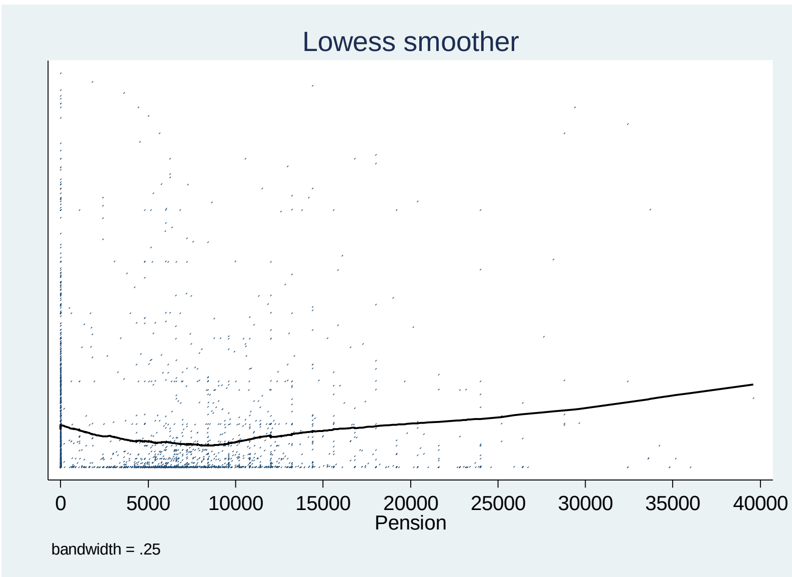
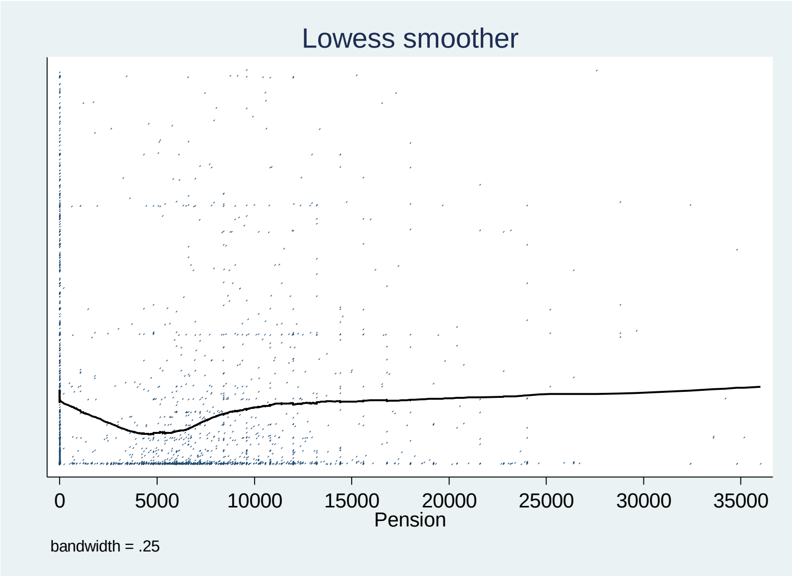
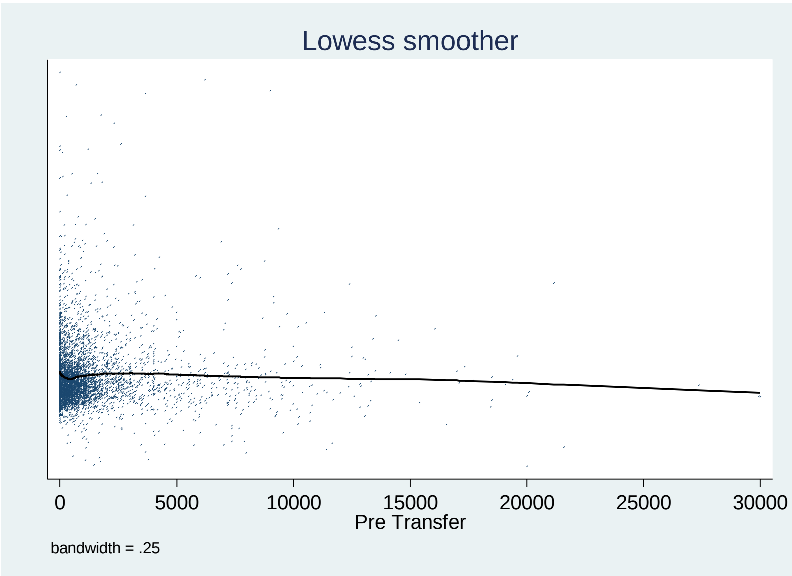


Figure 7.5: *Non parametric relationship between net transfer and pension after removing the outer layers, urban areas*



Note: the top 5% of net transfers and the top 1% of pension in Figure 7.2 are removed.

Figure 7.6: *Non parametric relationship between net transfer and all pre-transfer income, rural areas*



7.5 Discussion

Sociologists and economists have long studied intergenerational transfers, which in China and most developing countries tend to refer to transfers of money from adult children to old parents; a phenomenon that is totally different from that which characterises developed countries. Several empirical studies have been devoted to investigating the crowding-out hypothesis and the motives behind these transfers, most of which focus on distinguishing between altruism and exchange motives. Previous findings in this area are mixed, with multiple motives identified under different conditions. However, as previous studies on private transfers in China could not differentiate between intra-generational and intergenerational transfers, prevalent preconceptions of the situation with respect to intergenerational transfer can be misleading. This empirical chapter has examined how private transfers respond to parental income, while it is likely that both the demographic transition and reform of the pension system are putting traditional family-based support mechanisms under considerable strain in China. The uniqueness of the two national surveys used here has enabled me to analyse the situation in both urban and rural China. The findings have significant implications for understanding of how well traditional family-based support mechanisms are functioning, and of public programmes (pensions) impact upon private parental monetary support.

Throughout the chapter, preliminary analysis using descriptive statistics was carried out by age and residence location, in order to emphasise the age pattern and urban-rural differences. The age-related patterns that are found in this chapter include the increase in the probability of widowhood, decrease in conditions of health, decline in the amount and importance of pre-transfer incomes, and increase in the probability of receiving monetary transfers from children. The regional diversity shows that urban older people were better educated, healthier, and wealthier, but less likely to receive children's transfers, than their rural counterparts. These are very important factors in determining the occurrence and the amount of intergenerational transfer from children.

The descriptive statistics also show that intergenerational transfers are prevalent in China, particularly in rural areas, with an upward direction from adult children to old parents. This is consistent with findings from previous studies in China (e.g. Cai, Giles *et al.*, 2006; Chan, 2011; Lee & Xiao, 1998; Liu & Reilly, 2004). More specifically, the statistics reveal that family transfers are likely to be supplementary to pension incomes in urban areas, helping to ensure that old parents do not to fall into poverty. Conversely, family transfers are crucial sources of income for old parents living in rural areas; especially for female old parents. However, the datasets also show that such prevalence of upward intergenerational transfers had been declined during the period between 2000 and 2006.

The empirical results presented reveal a complex pattern of association between parents' income and children's transfers. On one level, the analysis shows that most intergenerational transfers in China tend to target parents that are in greater financial need. In both urban and rural areas I note that parents with higher incomes, or better access to retirement benefits, are less likely to receive transfers from their children. In contrast, parents in less good marital circumstances (for instance widowed) or who are in poor health, are found to be more likely to receive transfers from their children. The reason for this is most likely to be that children are naturally concerned with the well-being of their old parents. If parents' income is low, the children will be more likely to transfer money to their parents in order for them to be able to achieve a decent level of consumption, which is optimal from the children's point of view.

Nevertheless, one cannot say intergenerational transfer is altruism motivated and would be crowded out by public transfers at this point, because both altruism and exchange models predict a negative association between recipient income and the probability of receiving a transfer[95]. One can distinguish between altruism and exchange only through the transfer derivative in the regression of the transfer amount. To achieve such a goal, I have adopted several models to estimate the transfer derivative in order to obtain more accurate and robust results. Different linear models have shown a significant positive relationship between the amount of pre-transfer income and children's transfers in urban areas and seem to reject the crowding-out hypothesis. The application of a semi-parametric model found a mix of transfer derivatives in urban China, where intergenerational transfers are negatively associated with public transfers when parental income is very low, and are positively associated with public transfers when parents' income is relatively high. These findings together imply that altruism alone could not explain intergenerational transfers in urban China and suggest a co-existence of transfer motives.

In rural areas, although the semi-parametric model suggests a gradual negative correlation between recipient income and transfer from children, I did not find statistically significant coefficients of pre-transfer income from linear models. A possible reason may be because the income resources of older people in the agricultural sector are difficult to classify, and may have measurement bias in the data used. Adult children may offer financial support through cultivating parents' land, instead of giving money directly to the parents, in which case income from agriculture should be counted as a form of in-kind transfer. This insignificance may also come from the endogeneity introduced by pre-transfer income of older people in rural areas. As noted in section 7.2, if old parents

[95] See section 2.2 of Chapter 2.

decide not to farm or work because they had received sufficient monetary support from children, the coefficient of pre-transfer is upward biased. Conversely, if adult children believe that a parent on low income is not looking hard enough for employment, the coefficient of pre-transfer is downward-biased. The latter case is not very likely to happen in rural China where filial piety is still prevalent, and where supporting one's parents is generally regarded as the responsibility of the children. The coefficient of pre-transfer income is more likely to be biased upward in rural areas. This may explain why the estimations of pre-transfer income coefficients are positive and not significant in the transfer amount regression, because the bias may make it less negative or even positive. Accordingly, despite a lack of concrete evidence, results suggest that intergenerational transfer is more likely to be driven by altruism than by exchange motives in rural areas.

Finally, the findings from section 7.1.2 that upward transfers might be in decline in rural as well as urban areas are worth more discussion. Such decline in upward transfers is likely to be driven by both the supply and demand sides of such transfers. From the supply side, either children's capacity or willingness to support should have a positive effect on the decision to give monetary support to their parents. Consequently, a decline in upward transfers may be because children are less financially capable to support parents in old age, or simply because children are less willing to give monetary support. The data used in this thesis does not cover information on earning capacity or transfer willingness of children. One needs to find hints from indirect information. If children are not happy to support their parents in old age, the latter should feel impiety of the former. Descriptive statistics from section 7.1.3 do not find evidence that parents felt children's filial piety had been weakened over time. Moreover, regressions in section 7.3 show that parents with more children are more likely to receive transfers. These together imply that, the decline in upward transfers is not likely to be because children are becoming less willing to give monetary transfers. Instead, it is more likely to be driven by the decline in support capacity of children. Even assuming the same earning capacity unchanged, the decrease in number of children resulting from the demographic trend has increased the burdens of old-age support for the coming generations and makes upward transfers less possible.

Alternatively, if the demand for financial transfers decreases, upward transfers may decrease. From the panel data (Appendix 5.1), we know that there is an increase in annual pre-transfer income of 3022 *Yuan* and 341 *Yuan* for urban and rural older people, respectively. Regressions in section 7.3 show that parents with higher income are less likely to receive monetary transfers. It is also likely that the decline in upward transfers is partially driven by decreasing financial needs of parents.

Appendix 7.1: *Descriptive statistics for urban and rural non-co-resident samples, 2006*

	Urban		Rural		
Characteristics	M	SD	M	SD	Range
Age	70.93	6.40	71.02	6.85	60 - 103
Men	0.53	0.50	0.57	0.49	0 (no), 1 (yes)
Married	0.76	0.43	0.70	0.46	0 (no), 1 (yes)
Widowed	0.23	0.42	0.30	0.46	0 (no), 1 (yes)
Year of schooling	6.44	4.82	2.61	3.13	0 - 25
Number of children	3.25	1.40	4.13	1.59	0 - 13
Lived with children	0.00	0.00	0.00	0.00	0 (no), 1 (yes)
Household size	1.97	0.73	1.89	0.86	1 - 31
Children Not Filial	0.02	0.14	0.03	0.18	0 (no), 1 (yes)
Total annual income	12046	13212	2784	4111	0 - 555000
Regular monthly	400.63	922.07	160.79	381.28	0 - 30000
Received transfers	0.35	0.48	0.60	0.49	0 (no), 1 (yes)
Gave transfers	0.37	0.65	0.10	0.38	0 (no), 1 (yes)
Received pension	0.78	0.42	0.10	0.30	0 (no), 1 (yes)
Still worked	0.05	0.22	0.40	0.49	0 (no), 1 (yes)
Self-rated health	3.07	0.83	2.94	0.88	0 - 5
Difficulty in ADL	19.29	5.83	20.93	6.38	16 - 48
Owned property	0.77	0.42	0.65	0.48	0 (no), 1 (yes)
Had savings	0.32	0.46	0.13	0.33	0 (no), 1 (yes)
Help with babysitting	0.37	0.48	0.33	0.47	0 (no), 1 (yes)
Help with house work	0.16	0.37	0.29	0.45	0 (no), 1 (yes)
Beijing	0.05	0.22	0.06	0.23	0 (no), 1 (yes)
Shanghai	0.05	0.21	0.05	0.23	0 (no), 1 (yes)
Heilongjiang	0.04	0.20	0.06	0.23	0 (no), 1 (yes)
Shan3 xi	0.05	0.22	0.04	0.20	0 (no), 1 (yes)
Jiangsu	0.05	0.22	0.03	0.18	0 (no), 1 (yes)
Zhejiang	0.05	0.22	0.05	0.23	0 (no), 1 (yes)
Hubei	0.05	0.21	0.07	0.25	0 (no), 1 (yes)
Sichuan	0.06	0.24	0.06	0.24	0 (no), 1 (yes)
Yunnan	0.05	0.22	0.05	0.22	0 (no), 1 (yes)
Guangdong	0.05	0.22	0.04	0.21	0 (no), 1 (yes)
Fujian	0.04	0.21	0.02	0.13	0 (no), 1 (yes)
Anhui	0.04	0.19	0.04	0.20	0 (no), 1 (yes)
Hebei	0.03	0.18	0.05	0.23	0 (no), 1 (yes)
Shangdong	0.05	0.21	0.05	0.21	0 (no), 1 (yes)
Henan	0.06	0.23	0.06	0.23	0 (no), 1 (yes)
Xinjiang	0.06	0.24	0.07	0.25	0 (no), 1 (yes)
Shan1 xi	0.06	0.23	0.08	0.27	0 (no), 1 (yes)
Liaoning	0.06	0.23	0.05	0.22	0 (no), 1 (yes)
Hunan	0.06	0.23	0.03	0.18	0 (no), 1 (yes)
Guangxi	0.04	0.18	0.02	0.15	0 (no), 1 (yes)
Observations	5464		4350		

Appendix 7.2: *Descriptive statistics for urban and rural non-co-resident samples, 2000*

	Urban		Rural		
Characteristics	M	SD	M	SD	Range
Age	68.76	6.18	68.78	6.35	60 - 108
Men	0.54	0.50	0.58	0.49	0 (no), 1 (yes)
Married	0.77	0.42	0.74	0.44	0 (no), 1 (yes)
Widowed	0.22	0.41	0.25	0.44	0 (no), 1 (yes)
Year of schooling	5.63	4.97	2.12	2.97	0 - 24
Number of children	3.59	1.54	4.52	1.69	0 - 14
Lived with children	0.00	0.00	0.00	0.00	0 (no), 1 (yes)
Household size	1.96	0.62	1.96	1.00	1 - 33
Not Filial	0.02	0.13	0.03	0.16	0 (no), 1 (yes)
Total annual income	8205	8641	2248	4051	0 - 180800
Regular monthly	148.49	314.23	59.27	112.87	0 - 12020
Received transfers	0.38	0.50	0.66	0.47	0 (no), 1 (yes)
Gave transfers	0.25	0.52	0.14	0.43	0 (no), 1 (yes)
Received pension	0.74	0.44	0.09	0.29	0 (no), 1 (yes)
Still worked	0.10	0.30	0.43	0.50	0 (no), 1 (yes)
Self-rated health	3.11	0.90	3.02	0.94	0 - 5
Difficulty in ADL	15.36	4.42	16.99	3.59	13 - 39
Owned property	0.67	0.47	0.57	0.49	0 (no), 1 (yes)
Had savings	0.30	0.46	0.12	0.32	0 (no), 1 (yes)
Help with babysitting	0.35	0.47	0.43	0.50	0 (no), 1 (yes)
Help with house work	0.17	0.38	0.42	0.50	0 (no), 1 (yes)
Beijing	0.05	0.22	0.06	0.23	0 (no), 1 (yes)
Shanghai	0.05	0.22	0.05	0.21	0 (no), 1 (yes)
Heilongjiang	0.04	0.19	0.06	0.24	0 (no), 1 (yes)
Shan3 xi	0.06	0.24	0.06	0.24	0 (no), 1 (yes)
Jiangsu	0.05	0.22	0.03	0.17	0 (no), 1 (yes)
Zhejiang	0.07	0.25	0.07	0.26	0 (no), 1 (yes)
Hubei	0.04	0.20	0.07	0.25	0 (no), 1 (yes)
Sichuan	0.07	0.25	0.05	0.23	0 (no), 1 (yes)
Yunnan	0.05	0.22	0.06	0.24	0 (no), 1 (yes)
Guangdong	0.05	0.22	0.05	0.21	0 (no), 1 (yes)
Fujian	0.05	0.21	0.01	0.10	0 (no), 1 (yes)
Anhui	0.04	0.19	0.03	0.18	0 (no), 1 (yes)
Hebei	0.03	0.16	0.04	0.21	0 (no), 1 (yes)
Shandong	0.04	0.20	0.05	0.21	0 (no), 1 (yes)
Henan	0.05	0.23	0.06	0.24	0 (no), 1 (yes)
Xinjiang	0.06	0.23	0.06	0.24	0 (no), 1 (yes)
Tianjin	0.05	0.23	0.08	0.27	0 (no), 1 (yes)
Jilin	0.05	0.23	0.06	0.24	0 (no), 1 (yes)
Jiangxi	0.05	0.22	0.03	0.17	0 (no), 1 (yes)
Gansu	0.05	0.21	0.01	0.11	0 (no), 1 (yes)
Observations	4780		3834		

Chapter 8: Summary and conclusion

The aim of the final chapter of this thesis is to bring together the findings from the six substantive chapters, and to ask how these, taken together, better inform our ideas concerning intergenerational transfers in China. The core objective of this study is to illuminate the nature of interactions between private transfers and parental income, especially public transfers, in a sample of Chinese older people, and to examine the factors that may influence intergenerational transfers. The results presented add value to the knowledge about intergenerational transfer motivations in Chinese families. Whether families undo or reinforce changes in public transfers by adjusting private transfers plays a key role in influencing the effectiveness of redistributive policies for older people, such as social security and welfare programmes. An assessment of how private transfers respond to increases in public transfers will have important implications for old-age welfare and social policy design. Therefore, the core question this thesis aims to address is: If public transfers increase, would this crowd out private transfers?

In this concluding chapter, I begin, in 8.1, with a summary of the key findings from substantial analyses addressing the five research hypotheses listed in the methodology chapter. Methodological and data innovations that have informed these conclusions are presented in 8.2. The issue of filial piety is discussed in 8.3. In the concluding remarks, in 8.4, I outline the policy implications of this study. Finally, implications for future research are presented in 8.5.

8.1 Summary of findings

In Chapter 3 and 4, backgrounds of population ageing and pension reform have been provided in detail. Population ageing and the modernisation process have been proceeding in China for decades, and will still continue into the foreseeable future. There can be little doubt that intergenerational relationships will be modified over time, especially in urban and industrial areas. Socioeconomic transition has had a significant impact on people's attitudes towards caring for their old parents, and their expectations of being cared for in later life. Despite different degrees of adherence to traditional values of filial piety, it is not likely that young Chinese will maintain the same traditional family-based support for the rapidly increasing number of older people. Moreover, China is entering a new historical era that has population ageing as its primary demographic characteristic. Declining fertility and changes in economic mobility and social attitudes have been reshaping living arrangements between old parents and adult children, and pose challenges to the traditional family support system. As the historical modernisation process through which today's industrialised nations have passed indicates, socioeconomic and demographic changes may well have been weakening the ability and function of families to take care of older people in the way that they have for thousands of years in China (Leung, 1997; Zeng & Wang, 2003).

China is building up a functioning pension system, moving from the earlier enterprise-based pension system to a fully functioning social insurance system that covers the entire population. The term "pension reform" usually refers to retrenchment, or substantial cuts, in government spending on pensions, which is particularly true in today's Europe. But in the case of China, a series of reforms have resulted in a rapid increase in pension expenditure as well as liability. China's pension system is not financially sustainable on its own, but would require either a significantly increased contribution rate, or an enlarged subsidy on the part of the government. At present, only about half of retirees receive any forms of pension, and about half of workers are covered by the pension system. In a relatively long time, pension coverage rates, and benefits, are unlikely to increase rapidly. As a developing country, China has limited economic resources with which to confront the issue of old-age support, leaving limited room for increasing pension benefits nationally. Therefore, pension benefits are more likely to rise gradually, in which case family support will still continue to be the main pillar of old-age support for decades to come. This is particularly the case in rural areas, where the state pension system was founded in 2009, and where it offers low levels of benefit, even in the context of the relatively low cost of living that prevails in rural China.

While the state is establishing a functioning pension system to provide formal old-age support, adult children remain the principal care providers for ageing parents in China. However, the demographic trend implies that extended co-resident families are replaced by small, independent families. This has raised concerns over the sustainability of private old-age support and the possible impacts of public old-age support on the sustainability of private old-age support. The questions of: whether the trend of living arrangements will weaken private transfers; and whether an increase in public transfers will further weaken private transfers are to be addressed in this study.

8.1.1 The impact of living arrangements on intergenerational transfers

The descriptive statistics from chapter 6 show a changing pattern of living arrangements. The data suggests that although co-residence is still prevalent in China, old parents, particularly those who live in urban areas, are increasingly less likely to co-reside with their adult children. This finding is consistent with previous studies (Meng & Luo, 2008). In general, about half of Chinese older people co-resided with their children; more rural older people co-resided with children than their urban counterparts. The dominant living arrangement for urban old parents switched from co-residence with children to living with a spouse between 2000 and 2006. The dominant living arrangement in rural areas remains co-residence, although it experienced a decline during the period 2000–2006.

Nevertheless, the data suggests that such a change in living arrangements does not leave older Chinese people isolated over time. Most old parents (more than 95%) have some children living in the same county/city, while only less than 3% of old parents (those who had children) did not have children living in the same province. In addition, as a parent becomes older, he/she is less likely to live with his or her children, but more likely to have a child live nearby. Once an old parent becomes infirm (at around 75 years old), the older he/she is, the more likely he/she will be co-reside with children, but the less likely he/she will be to have a child living nearby. This implies that at least one adult child will return to the parental household to fulfil the obligation of taking care of parents.

The data also suggests that the change in living arrangements partially arises from changes in old parents' preference in terms of living arrangements. Descriptive statistics imply that old parents do not show a great desire to live with children, and that a willingness to co-reside has been declining over time for all age cohorts. In addition, old parents who lived with a spouse were less inclined to wish to co-reside than those who lived alone and those who lived with grandchildren. Such differences in preference for co-residence are minor in urban areas, but significant in rural areas. This is because in rural areas, where social welfare is less developed, the spouse plays a more important role of old-age care than in urban areas, where other forms of substitute care are easier to access.

Empirical analyses have been investigated to address the research hypotheses listed in Chapter 5.

Hypothesis 1: Old parents with more financial or instrumental needs are more likely to live with children. Empirical results from chapter 6 seem to support this hypothesis. Both linear probability and logit models show that old parents whose spouse passed away or with more difficulties in ADLs are found to have a significantly higher probability of co-residence. Contrarily, old parents who are better educated (generally implying higher social and/or economic status), own a property or have savings for their old age are found to be significantly less likely to live with children. I do not find a statistically significant relationship between contemporary pre-transfer incomes and the decision to co-reside, which is not inconsistent with previous studies (e.g., Cai, Giles *et al.*, 2006; Lei, Strauss *et al.*, 2011). The finding of the unresponsiveness of co-residence to parental contemporary incomes does not necessarily contradict the finding of the responsiveness to parents' economic status. This may be because adult children generally know the magnitude of their parents' wealth better than their patents' contemporary income level. The analysis of determinants of living arrangements suggests that coresidence is an important source of old-age support in China and coresidence itself may reflect altruism on the part of children.

Hypothesis 2: Living distance from children has a negative and significant effect on occurrence of receiving intergenerational transfers. Empirical results from chapter 6 seem to reject this hypothesis. Estimations suggest that the incidence of receiving net transfers from children is positively related to children's living distance (coresiding, not coresiding but have a closest adult child living in the same county/city, not coresiding but have a closest adult child living in another county/city). Compared to those coresiding with children, parents having a closest child living in the same city or parents having a closest child living in another city are more likely to receive net transfers from children. Although the evidence is weak (for example, the coefficient of “Has a closest child in other city” for urban residents and the coefficient of “Has a closest child in other city” are not statistically significant), regressions do not indicate that living far from children reduces the probability of receiving intergenerational transfers.

Hypothesis 3: Conditional on intergenerational transfers occurring, living distance from children has a negative and significant effect on the size of transfers. Empirical results from chapter 6 do not support this hypothesis. The estimation shows a positive relationship between children’s living distance and the amount of net transfers parents received for urban older people. In urban China, parents living far away from adult children are predicted to receive a larger amount conditional on the occurrence of net transfer. However, the regression for rural older people suggests that instead of coresidence, living close to children reduces the amount of intergenerational transfers, while living far away from children increases the amount of intergenerational transfers from children to parents. The negative relationship between proximity and the amount of transfers parents received does not necessarily imply that parents not co-residing with children receive less support. This may be because in rural areas, inter-household transfers often take the form of labour input into family farming (Lee & Xiao, 1998), rather than giving money directly to the parents. Proximity to parents makes such indirect transfers easier, in which case children may reduce the direct financial support to parents.

Finally, let us come back to the first research question set in Chapter 1: Will the trend of living arrangements weaken private transfers? As the new generation of older adults is becoming better educated, a consequence is that Chinese older people are likely to be more financially independent and less willing to reside with their children. Demographic changes, consisting of a decreasing number of children and increasing labour mobility, have also contributed to such a trend in living arrangements. The trend of decreasing extended households and increasing nuclear households will persist for at least decades ahead. Although the tendency towards co-residence has been weakened, a new type of dominant living arrangement has emerged. Living close to, rather than with, adult children will become the primary living arrangement for future older Chinese people. The analyses of determinants of co-residence and its impacts on intergenerational transfers of older people suggest that living close to children, rather than co-residing with them, does not necessarily weaken private transfers and has become an important way of providing support in old age. The family unit, and the traditional family support for older people, seem likely to continue to be an essential pillar upon which old-age security rests.

8.1.2 The impact of parental income on intergenerational transfers

The descriptive statistics in Chapter 7 show that intergenerational transfers are prevalent in China, particularly in rural areas, with about half of old parents received upward monetary transfers from adult children. In contrast, downward transfers from old parents to children are rare. This is consistent with findings from previous studies in China (e.g. Cai, Giles *et al.*, 2006; Chan, 2011; Lee & Xiao, 1998; Liu & Reilly, 2004). The age-related patterns that are found in chapter 7 include the increase in the probability of widowhood, decrease in conditions of health, decline in the amount and importance of pre-transfer incomes, and increase in the probability of receiving monetary transfers from children. The regional diversity shows that urban older people were better educated, healthier, and wealthier, but less likely to receive children’s transfers, than their rural counterparts. More specifically, the descriptive statistics reveal that private monetary transfers are likely to be supplementary to pension incomes in urban areas, and will ensure that old parents do not to fall into poverty. Conversely, older people in rural China rely mainly on family transfers, especially older women in rural areas. However, the datasets show that such a prevalence of upward intergenerational financial transfers was slightly undermined during the period between 2000 and 2006.

The main target of Chapter 7 is to examine how private transfers respond to parental income by addressing hypotheses 4 and 5 listed in the beginning of Chapter 5.

Hypothesis 4: Old parents with higher incomes are less likely to receive financial transfers from children. Empirical results from section 7.3 support this hypothesis. The analysis of determinants of the incidence of receiving transfers from children shows that most intergenerational transfers in China tend to target parents that are in greater financial need. In both urban and rural areas, it is found that parents enjoying higher incomes or better access to retirement benefits are less likely to receive transfers from their children. By way of contrast, parents in more difficult matrimonial circumstances (for instance those who have been widowed), or in poor health, are found to be more likely to receive transfers from their children. The reason for this is most likely to be that children are, naturally, concerned with the well-being of their old parents. If parental income is low, children will be more likely to transfer money to the parents in order for them to achieve a reasonable level of consumption, which is optimal from the children's point of view.

Nevertheless, one cannot state that intergenerational transfers are altruistically motivated at this point, because both altruism and exchange models predict a negative association between recipient income and the probability of receiving a transfer. As discussed in chapter 2, one can distinguish between altruism and exchange only through the transfer derivative in the regression of the transfer amount. A negative transfer derivate is consistent with both altruism and exchange theories, whereas a positive association is consistent only with the exchange theory. Empirical analyses have been investigated to address the core research question of this thesis: Will an increase in public transfers further crowd out private transfers?

Hypothesis 5: Conditional on intergenerational transfers occurring, old parents with higher incomes receive a smaller amount of financial transfers from children, supporting altruism theory and crowding-out hypothesis. Empirical results from section 7.4 do not support this hypothesis. The analysis of the determinants of the amount of transfers that parents received shows a complex pattern of association between parental income and transfers from children. In urban areas, different linear models have shown a statistically significant positive relationship between the amount of pension income and children's transfers (Table 8.1). The application of a semi-parametric model found a mix of transfer derivatives in urban China, where intergenerational transfers are negatively associated with public transfers when parental income is very low, and are positively associated with public transfers when parents' income is relatively high. These findings together imply that altruism alone could not explain intergenerational transfers in urban China. The crowding out effect appears when old parents are at very low income level. When parental income is at high level, the semi-parametric model suggests that we might obtain a crowding-in effect of public transfers. Therefore, it is likely that there is a co-existence of transfer motives: children demonstrate altruistic motivation when parents' income is very low; and appear to become more inclined to be motivated by exchange motives when parents' income becomes relatively high.

In rural areas, although the semi-parametric model suggests a gradual negative correlation between recipient income and transfer from children, I did not find statistically significant coefficients of pre-transfer income from linear models. A possible reason may be because the income resources of older people in the agricultural sector are difficult to classify, and may have measurement bias in the data used. Adult children may offer financial support through cultivating parents' land, instead of giving money directly to the parents, in which case income from agriculture should be counted as a form of in-kind transfer. This insignificance may also come from the endogeneity introduced by pre-transfer income of older people in rural areas. As noted in section 7.2, if old parents decide not to farm or work because they had received sufficient monetary support from children, the coefficient of pre-transfer is upward biased. Conversely, if adult children believe that a parent on low income is not looking hard enough for employment, the coefficient of pre-transfer is downward-biased. The latter case is not very likely to happen in rural China where filial piety is still prevalent, and where supporting one's parents is generally regarded as the responsibility of the children. The coefficient of pre-transfer income is more likely to be biased upward in rural areas. This may explain why the estimations of pre-transfer income coefficients are positive and not significant in the transfer amount regression, because the bias may make it less negative or even positive. Accordingly, despite a lack of concrete evidence, results suggest that intergenerational transfer is more likely to be driven by altruism than by exchange motives in rural areas.

Moreover, one may predict the potential transfer derivative for rural older people using the result for urban older people. From Tables 7.6 and 7.8 we know that the income of urban older people is about 5 times higher than that of rural older people (14581 *Yuan* for urban men and 8492 *Yuan* for urban women, against 2418 *Yuan* for rural men and 1764 *Yuan* for rural women). Assuming the estimated relationship between private and public transfers for urban older people (Figure 7.5) applies for their rural counterpart, in other words, assuming rural older people were a group of individuals at the lowest quintile of income level in urban China, given everything (e.g., average educational level, average number of children, children's filial piety and so on) is the same for urban and rural older people, except their income difference, the prediction of Figure 7.5 suggests that an increase in public transfer may crowd out private transfers in rural areas.

Table 8.1: *Summary of the estimated transfer derivatives, urban and rural areas*

	OLS	OLS	2SLS	OLS	2SLS
	2006 data	Pooling data	Pooling data	Panel data	Panel data
Urban areas					
Pension	27.14	0.04***	0.17***		
Change in pension				-0.06***	0.20*
Rural areas					
All pre-transfer incomes	3.85	0.01			
Change in pre-transfer				0.01	

Note:
1) Both underidentification and Sargan (overidentification) tests have confirmed the validity of IVs in the 2SLS models.
2) ***Denotes statistical significance at the 1% level, **denotes statistical significance at the 5% level, and *denotes statistical significance at the 10% level.

8.2 Strengths and limitations

The datasets used in this thesis have some clear advantages over previous empirical studies of intergenerational transfer in China. Firstly, this study is likely to be the first using nationally representative data. Compared to data at city/county level, or at provincial level, used by previous studies, the data I have used in this thesis covers around 20,000 individuals aged 60 and over from 20 provinces, making it more nationally representative. Most of the previous empirical work (e.g. Cai, Giles *et al.*, 2006; Lee & Xiao, 1998; Liu & Reilly, 2004; Secondi, 1997) used household-level data, and were unable to differentiate between intergenerational transfers and intra-generational transfers, which may have served to bias the results since the intra-generational transfer motive is different from the intergenerational transfer motive. The second advantage is that the survey collected information from older people directly, allowing me to differentiate between intergenerational transfers and intra-generational transfers. Thirdly, in providing data on pensions received by older people in China, the surveys also afforded me the opportunity to directly investigate and analyse the relationship between public transfers and private transfers from the children of the older people concerned. In contrast, previous studies did not enjoy this advantage, and were thus only able to focus on the relationship between the pre-transfer incomes of old parents, and transfers made by their children. Fourthly, the panel nature of the two datasets enabled me to reduce bias from non-time-varying endogenous variables. This is the first study in this field to use panel data. The first difference regression adopted in this thesis theoretically provides more robust results, because variables that do not vary across time - either observable or unobservable - will be offset. Finally, the data minimises potential endogenous bias from decision to work. Many previous studies have assumed non-public pre-transfer income is exogenous. However, non-public pre-transfer income may be endogenous with the labour supply decisions of parents, and may not be exogenously assigned to respondents. The dataset I used in this study covers individuals aged 60 and over. Considering the legal retirement age for men is 60 and for women is 55, such potential endogeneity of pre-transfer incomes should be minimized in urban areas, where most older people are engaged in wage-employment.

In addition, the methodology that I have adopted in this thesis has some advantages over methodology adopted in previous studies. Most of the previous work (e.g., Chan, 2011; Lee & Xiao, 1998; Liu & Reilly, 2004; Secondi, 1997) assumes a single, linear regime of transfer derivative, which is not realistic and may be unfounded. This is because several different motives may lie behind the private transfers that adult children make, and these motives may switch between one another as the income of parents changes. The non-linear methods I have adopted to investigate transfer motives in this thesis enabled me to take into account the co-existence of multi-transfer motives, and to present a non-parametric relationship between public transfers and private transfers. Moreover, the 2SLS methods are applied in this thesis as a control for potential endogenous bias from the key variable of pension incomes and change in pension incomes. Most studies assume that pension incomes are exogenous. However, findings from chapter 6 suggest that in urban areas pension benefits are tied to current provincial wage levels. Findings from chapter 3 show that since most children lived (thus worked) in the same province as their old parents, changes in pension benefits are likely to be linked to changes in children's eventual wages. Finally, by excluding respondents in the sample co-residing with their children, I reduced any potential bias from the decision of co-residence. This is because the decision to co-reside with old parents may itself reflect a net transfer to or from the adult child, and may consequently bias the estimated results of the relationship between parents' income and transfers from children.

The dataset used in this thesis shares the same limitations as some previous work. Firstly, the data does not have good measures of other dimensions of intergenerational transfer, such as instrumental and emotional transfers. Secondly, very little information is available about the adult children and siblings of respondents. Key variables, such as the age of children and siblings, education, income, employment status, marital status, and gender, are missing. As the family network is a potential source of transfers, such unobservables may bias analyses of the transfer motive. Thirdly, measurement errors of transfers may exist, and bias the results, because respondents may not tell interviewers their incomes or may not remember correctly the exact amount of money given to, or received from, their children. Fourthly, income resources of old parents in rural areas are not clearly classified. It is likely that children help their old parents farm during busy farming seasons, in which case part of the incomes from farming should be counted as in-kind transfers. However, the survey does not allow me to separate in-kind assistance on the part of children from their parent’s income. Finally, the pre-transfer incomes of old parents in rural areas may suffer from endogenous decisions to work, because they are free to make the decision to farm or not at any age.

8.4 Implications for policy

The Madrid International Plan of Action on Ageing, which was adopted in the Second World Assembly on Ageing in 2002, is generally recognised as widely influencing both the debate on intergenerational solidarity in China and the Chinese government's policies “to respond to the opportunities and challenges of population ageing in the twenty-first century and to promote the development of a society for all ages”[96]. In October 2006, President Hu Jintao delineated a political doctrine during the 4th Plenary Session of the 10th National Committee of the Chinese People's Political Consultative Conference that calls for a "harmonious society" (Fan, 2006). One of the main goals of building such a harmonious society is to narrow the gap between urban and rural and between regions and age groups. Without improving intergenerational solidarity and intergenerational equality, to facilitate the sharing of the benefits of economic growth, it is not likely that China will be able to build such a harmonious society with sustainable prosperity.

Debates on intergenerational solidarity and old-age support have focused the attention of both scholars and policy makers on the requirement of social policy and developmental strategy to build a harmonious society. China is entering a new historical era that has population ageing as its demographic hallmark. The trend of diminishing

[96] Political Declaration of the Second World Assembly on Ageing, 2002, article 1.

household size, and the increasing prevalence of non-coresidence, will persist for the decades ahead. A growing number of Chinese older people will be accompanied by a shortage of "kin supply" available to meet future needs for financial support. Chinese older people will also, with increasing frequency, find that their preferred living arrangement is unmet, and that their children are not always in a position to provide the requisite support. Promoting filial piety, or preventing its erosion, is an option for countries – and particularly China, where Confucian family values originated - which are facing the challenge of rapid population ageing. However, in the long term, the establishment of a well-functioning social welfare system is likely to be an indispensable pre-requisite to meeting the challenge of a rapidly growing older population.

Chinese older people can no longer solely rely on filial piety and their children to support them in old age. The ideology of filial piety, *per se*, does not offer a sufficient inducement to the younger generation to fulfil their obligations to take care of their old parents. The significant economic achievement for the last three decades also implies the young generation has been working harder, and facing a more competitive life. Increased labour mobility, together with the declining levels of child-births, have further weakened children's capacity to support their parents in old age. Even if children want to be dutiful towards their parents, they are likely to feel that it is very difficult to do it in the traditional way that involves co-residing with parents, and providing financial and instrumental support. They may find it difficult to give sufficient financial support to parents who are not covered by the pension insurance scheme. Moreover, when old parents are sick, their children cannot bear the high medical cost; when old parents need long term care, their children are not able to stay at home to take care of them. The need for formal institutional old-age support, such as old-age insurance programmes, medical systems and long-term care centres, will increase rapidly in the years ahead.

The newly-emerging pattern is to share the responsibility of support for older people between the twin institutions of the state and the family unit, based upon finding a new equilibrium in the balance between formal and informal support. The state takes the responsibility for basic economic support in order to guarantee a minimum standard of living, while families provide supplementary and alternative support with a view to improving the quality of life in old age. China is reforming its pension system, with an increasing coverage rate and benefit level and the target to fully cover the whole population. This goal will increase the current pension liability and will require a huge amount of future transfers from the budget of the Chinese government to social security funds. A key question is the effectiveness of the current pension policy, in other words, whether public transfers (pensions) will crowd out private transfers. This thesis suggests it is possible that a gradual increase in public transfers aimed at improving the well-being of older people may not serve to further weaken private transfers, and may serve to actually strengthen private transfers – particularly within cities. In theory, this is because the type of motivation that explains intergenerational transfer behaviour in cities is that of exchange. More importantly, appropriate old-age policy is fundamental for children to practise filial obligation. The two surveys used in this thesis suggest that from the parents' view, there is no evidence that filial piety has been undermined over time. At least, there is no evidence that parents felt filial piety had been weakened over time. By lessening the burdens of old-age support, young adult are likely to be more – not less - willing to fulfil their filial obligations towards their old parents. Filial piety, and with it the family-based support mechanism, will continue to play an important role only if it is combined with the development of a functioning pension insurance system.

This may not be the case in rural areas where older people receive very low annual income. Although concrete empirical evidence is lacking, intergenerational transfers are more likely to be driven by altruism in rural areas, given such low parental income. A gradual increase in public pensions is likely to crowd out private transfers for rural parents. There may be one way to avoid such a crowding-out effect if transfer motives co-exist and will switch from altruism to exchange motive when rural parents are at a relatively high income level, just as has been found for urban older people. With adequate dataset, one may accurately estimate the cut-off level K in Figure 5.2, in other words, at which income level the transfer motive switches from altruism to exchange. At least in theory, a government could increase the pension benefit by a large amount until it exceeds the level K, in which case such an increase in pension should not crowd out private transfers. However, in practice, it is not likely that pension benefits will increase rapidly in China. This is especially true in rural China as the new rural pension insurance scheme is targeted to expand coverage rate and at the same time to maintain pension benefit at a low level. Therefore, it is likely that the on-going new rural pension insurance scheme has a negative effect on private transfers from children to old parents in rural China.

8.5 Implications for future study

This thesis has several implications for future research in the field of well-being in old age. For example, this thesis suggests that any future survey on ageing issues could be conducted in such a way as to address the key limitations of the current study. Specifically, detailed information on both generations should be collected by face-to-face interviews. According to the transfer theories discussed in chapter 2, the characteristics of both parents and children have an impact on intergenerational transfer. Lacking information on children will constrain the results to the demand (old parents) side, and introduce bias. Conversely, with such information, researchers would be able to examine each child's influence on the interactions of his or her sibling(s) with their old parents. In addition, as China announced its new pension insurance programme in rural areas in 2009, the issue of responsiveness of private transfers to public transfers in rural areas will definitely attract attention from scholars and policy makers. Future survey data should clearly identify the incomes of rural older farmers so that measurement errors may be minimised. Attention should be paid to distinguish old parents' own income from any shared incomes with their children.

The findings of this thesis also suggest directions for future study. This thesis focuses mainly on financial transfers and the financial well-being of older people. However, the other two dimensions of intergenerational transfer - instrumental (time related) transfers and emotional transfers - have not been discussed in detail. Therefore, future studies might wish to pay more attention to time-related and emotional transfers; in particular, the determinants of time-related and emotional intergenerational transfers, how different types of intergenerational transfer interact, and whether they serve as substitute or are complementary to one another. More importantly, the well-being of an older person is not only measured by his or her economic well-being, but also by his or her psychological well-being. Recent studies indicate high rates of suicide among older people in China, especially in rural areas (Chen, 2009; Jing, Jie *et al.*, 2011). This has raised concern about the possible impact of socio-economic change on subjective feelings of well-being among older people. Future studies may wish to investigate how different types of intergenerational transfer together influence the psychological well-being of older people.

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