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Pension Reform in China: Racing Against the Demographic Clock

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Abstract
China is experiencing rapid ageing as a result of declines in fertility combined with significant increases in longevity. According to current UN projections, more than a quarter of the population will be over 65 years old by 2050, and the old-age dependency ratio is expected to triple to almost 40 per cent. In recent years, the Chinese government has introduced a number of initiatives to reform the pension system in an attempt to address the issues of profound population aging, social disparity and regional imbalance. However significant issues remain relating to uneven coverage, fragmentation, financing, investment strategy and legacy costs. As well, China faces broader economy-wide challenges due to rapid urbanisation, changes in family structure and globalisation. Using data from the China Household Finance Survey – a new nationally representative survey of 8,438 households we critically assess the Chinese pension system using both individual and economy-wide criteria. We advocate that the key to sustainable reform will be the establishment of a regulatory framework with well-defined governance structures for both publicly and privately managed pension assets.

Keywords
pensions, China, demographic change, demographic dividend

1. Introduction

Pension policy reform in China is taking place at a rapid pace. Over the past 4 years the retirement income system has evolved from a system almost exclusively for urban and public sector workers (who comprise less than 30 per cent of the labour force) to one with broad national coverage. However, this apparent success masks structural and governance deficiencies which could threaten the adequacy and security of pensions for future retirees.

This pension reform is being undertaken in an economic environment characterized by phenomenal growth. Since 1978 the Chinese economy has grown by a factor of 90 and over the past 25 years the average annual growth rate has been in excess of 10.5 per cent. Despite the recent slowdown in the world economy, the prediction for the next four years is for growth of around 7.5 per cent a year. A key contributor to this growth has been the large and increasing size of the Chinese workforce, both in aggregate and relative to the non-productive population of the very old and the young. This important, but temporary phenomenon has provided China with a 'demographic dividend', which not only has made a large contribution to economic growth but also provides an important window of opportunity to make key structural changes to economic and social infrastructure.

Despite its rapid growth, the Chinese economy is still less than 50 per cent of the size of the US economy, and GDP per capita (in PPP terms) in 2012 was only 20 per cent of that in the US (Intl $9,233, compared to Intl $49,965 for the US). As well, economic and social development is characterized by large regional differences, with high and increasing living standards in the eastern coastal provinces, while much of the central and western areas remain poor and undeveloped. These differences subsequently extend to other socioeconomic indicators such as education, health, and life expectancy However, urbanization is increasing at a rate of around 10 per cent a year and the proportion of those people living in urban areas reached 52.6 per cent of the population in 2012.

Against this back drop of rapid (but uneven) growth, China's population is rapidly ageing. This is due to a sharp fall in fertility since the mid-1960s, a sharp decrease in infant mortality, and vastly improved life expectancies. The ageing population has the potential to put strain on retirement income provision, and other age-related expenditures.

The establishment of a national retirement income system in China dates back to only 1997. Following a late start, its development is progressing at a rapid pace with huge improvements in pension coverage over the past 15 years. It is estimated that 797.7 million workers are covered by pension schemes and 132 million are in receipt of retirement pensions. However many challenges remain, relating to the structural design of the system and very large differences in coverage and pension adequacy by region and sector, as well as from the implications of demographic transition.

There has been considerable international interest in the progress and policy design of pension reform in China, with most commentators suggesting a national centrally funded safety net pension; unification of the current fragmented schemes to facilitate portability, risk pooling and benefit equality; the introduction of notional defined contribution accounts for salaried workers with separation of legacy costs from current financing, to enhance incentives and transparency; and a greater role of voluntary pension plans (see for example, Barr and Diamond 2010; Dorfman et al. 2013b). However, as we argue below, it is not clear that sufficient attention has been paid to the practical implications of these proposals.

In this paper we critically assess the developments in China's retirement income arrangements in the context of the rapidly changing demographics and economic conditions. We utilise data from the recently implemented China Household Finance (CHF) Survey to illustrate differences between actual and expected policy outcomes. We start in section 2 with a discussion of the key demographic trends. In section 3 we provide a description of the current retirement income arrangements. These are evolving rapidly with reforms announced in 2009 and 2011 providing the potential to significantly increase both geographical and individual pension coverage. In section 4 we provide an assessment of the impact of the current pension arrangements (as well as recent proposed reforms) on both individual retirees and the broader Chinese economy using both individual and economy-wide criteria. We conclude in section 5 with a discussion of future prospects and suggestions for further reform. Overall, we advocate that the key to sustainable reform will be the establishment of a regulatory framework with well-defined governance structures for both publicly and privately managed pension assets.

2. Demographic challenges[1]

China's population is aging rapidly. Over the past 50 years China has experienced a sharp fall in its fertility rate combined with a rapid increase in life expectancy. Demographic change has been so rapid that China is expected to become an old country (defined by the United Nations (UN) as where at least 14 per cent of its population is age 65 or over) [2] before it's GDP per capita matches that of the rich developed world.

Figure 1 compares the total fertility rate in China with a number of comparator regions and countries including India (a country of similar size), Europe, the US and Australia (representing the developed world) and Japan (an 'ageing' near neighbor).

[1] This section draws on Deutshe Bank Research (2006), Impavido et al. (2009), Herd et al. (2010) and OECD (2011).

[2] The United Nations considers a country to be ageing when 7 per cent of its population is aged 65 or over and 'old' when 14 per cent of its population is 65 or over.

<insert Figure 1>

According to UN population projections, over the past 50 years the total fertility rate in China has fallen from around 6 to 1.63, although there is some disagreement about the accuracy of this figure. In 2010, the Sixth National Population Census conducted by the National Bureau of Statistics reported that the total fertility rate in China stood at 1.18[3].

The most rapid fall in fertility (from around 6 to around 3 live births per female) took place between the mid-1960s and mid-1970s. This can be attributed to disruptions to family formation due to the Cultural Revolution and the government's birth planning campaigns that promoted later marriage, longer intervals between births, and fewer births (Riley, 2004). This initial fall in fertility actually took place before the official introduction of the so-called 'single child policy' in 1978. Following the 'official' introduction of the single child policy, the fertility rate subsequently fell further from around 3 to less than 2 by the 1990s and currently stands at 1.63. It is important to note that while the 'single child policy' is an important contributor to the sharp fall in the total fertility, it is likely not the sole cause. While the policy has been applied strictly in the cities, observance has been more relaxed in the rural areas (where, despite urbanization, still accounts for around one half of the population). As well, it has not applied at all to minority ethnic groups, where the total fertility rate still stands at around 3 or 4.[4] As a result, there are large regional differences with the total fertility rate ranging from less than 1 in Beijing and Shanghai to 2.2 in the Western province of Xinjiang. As well, as noted earlier, while the average national total fertility rate of 1.63 (as indicated by the UN) is well below the 2.1 rate necessary for population replacement there is some debate about the actual fertility level. It is unclear whether the announcement in late 2013 relaxing the operation of the single child policy will have any effect on the fertility rate.

Turning now to the comparator countries, the total fertility rate in India, which was also around 6 in the middle of the last century has only fallen to 3 (around twice the fertility rate in China), while that of the developed world on average (Europe, the US and Australia) fell from around 3 in the 1950s to around 1.7 by 2010. Despite the operation of the single-child policy in China for the past 35 years, the total fertility rate in China is similar to the average for Europe, and actually higher than in Korea, Japan and Singapore.

[3] The rate was 0.88 in cities, 1.15 in townships, and 1.44 in rural areas.

[4] In fact, the so-called one child policy is probably an oversimplification of the causes of the decline in fertility. It is possible that other social and economic factors such as advances in education, improvements in the position of women and reductions in mortality have also contributed to the general decline in fertility (Peng 2011).

As well as a sharp fall in fertility, China has experienced a rapid reduction in child mortality and a rapid increase in life expectancy. As compared to the developed world, this has happened in a very compressed time frame.

<insert Figure 2>

Figure 2 shows improvements in life expectancy at birth, both sexes combined, for China, India, Europe, the US, and Japan over the period 1955-2012. In the mid-1950s, life expectancy at birth in China was only 44 years, compared with life expectancy at birth of close to 70 in developed countries. However, from the mid-1960s China experienced a sharp increase in life expectancy due to improvements in nutrition and better access to health services. By the first decade of the 21st century, life expectancy at birth in China has reached 74 years, only 2-3 years lower than the average for Europe. As with fertility rates, there are large regional differences from an estimated life expectancy at birth of 68.2 years in the Western province of Xizang to 80.2 years in Beijing and Shanghai. By 2050, average life expectancy at birth in China is projected to reach around 80.

The impact of the sharp fall in fertility in conjunction with the equally sharp increase in life expectancy is illustrated by the changing shape of China's population pyramid. Over the period 1990 to 2050 China's population pyramid is projected to evolve from 'normal' to 'inverted' as the number of people in younger age groups shrink while the number in older age groups deplete at a decreasing rate (see Figure 3). In countries such Australia and the US, with higher birth rates, and significant net migration, the effect of population ageing on the population pyramid is less severe. While the age profiles for much of Europe, Japan, Korea and Singapore exhibit quite similar patterns to China, the pace of change for the Chinese population has been much faster. The population pyramid also exposes another feature of demographic change in China: that is, the increasing imbalance between females and males. For the current cohort of 0 to 5 year olds there are 119 males for every 100 females.

<insert Figure 3>

A consequence of this rapid population aging has been an increase in the age dependency ratio and the median age of the population. Again, in China, the rate of change of these metrics is much faster than elsewhere. Figure 4 illustrates the increase in the median age in China and compares actual and projected increases in the age dependency ratio for China with India, Europe, the US, Japan and Australia.

The age dependency ratio provides a measure of the burden of the 'old' (those aged 65 and over) on the working population. For Australia and the US, the age dependency ratio has increased gradually, and for India, it has hardly changed. While the age dependency ratio in China is starting from a much

lower base, of below 10 per cent today compared with around 14 per cent in Australia, it is expected to more than quadruple over the next four decades. By 2050 China's age dependency ratio is projected to be higher than both Australia and the US and significantly higher than India. At this time China is expected to support around one quarter of the world's population over the age of 85.

An implication of an increase in the age dependency ratio is a reduction in the number of workers available to support the elderly. Currently there are 6.1 Chinese workers for each person over age 65, but this is projected to fall to 1.6 by 2050. Finally, an increasing median age is an indication that the overall population is 'ageing'. As illustrated in Figure 4, the median age in China has increased from 24.7 in 1950, to 34.6 in 2012, and is projected to reach a peak of 46.3 in 2050.

<insert Figure 4>

Some stages of demographic transition have favourable economy-wide impacts. For example, when falling fertility rates and child mortality precede the improvements in life expectancy of the elderly population, the working population as a proportion of the total population is likely to be high. This 'state' allows a country to benefit from a so-called 'demographic dividend'. A 'demographic dividend' is a source of potential investment in human capital and an increase in domestic demand and provides a window of opportunity for constructive policy development (Bloom et al. 2003). Bloom and Finlay (2009) suggest that around one-quarter of China's economic growth between 1965 and 2005 can be attributed to growth in the working population. However, a 'demographic dividend' has a limited lifespan. As the population which generated the 'demographic dividend' grows old and retires, the dividend becomes a liability, particularly when associated with continued falls in fertility and increases in life expectancy. Trends in the working population as a proportion of the total population for China, Japan and Australia are illustrated in Figure 5. It is clear that China has benefited from this 'demographic dividend' over the past 30 years or so, but that this window of opportunity is rapidly closing.

<insert Figure 5 >

This summary of demographic trends indicates that while China's key demographic indicators such as fertility and mortality are now quite similar to those in much of the developed world, the rate of change has not only been much faster, but is taking place at an earlier stage of economic development. For example, it is projected to take China just 26 years (from 2000 to 2026) to transition from an 'ageing' country (ie, where at least 7 per cent of the population is age 65 and over) to an 'old' country (where at least 14 per cent of the population is age 65 and over). For a developed country such as France, this transition took 115 years. Furthermore, when the US reached China's current median age of around 35 in the early 1990s, its GDP per capita (PPP) stood at

between Intl$ 25,000 and Intl$ 30,000, compared with GDP per capita for China of just Intl$ 9,233 in 2012.

These demographic trends have important implications for the effectiveness and sustainability of China's retirement income arrangements. The social insurance and assistance arrangements are still unsophisticated and immature, as one would expect of a country at a similar stage of economic development, and a national pension scheme was only introduced in 1997. However, as indicated earlier, the rapid pace of demographic transition will quickly bring to a close the window of opportunity for large scale structural reform provided by the 'demographic dividend'.

The focus of the discussion so far has been on population-wide demographic trends. However, the impact of demographic transition on the long term sustainability of China's retirement income arrangements will be exacerbated by inter-related population and social trends including the rapid pace of urbanization, the likely decline in the level of family support available for the elderly (due both to urbanization and significantly smaller family sizes), and the prevalence of (and possibly increase in) large regional differences in demographic, economic and social indicators (Jackson et al. 2009).

3. Current retirement income arrangements in China

Two features of the retirement income arrangements in China stand out. The first is that the systematic implementation of a national pension has been quite recent, and the second is that the current pension arrangements are fragmented and apply quite differently by sector and region.

The current arrangements date back to the introduction of a national pension scheme for urban salaried workers in the mid-1990s. Retirement pensions, on a pay-as-you-go (PAYG) basis, had been introduced for the employees of State Owned Enterprises (SOEs) (urban enterprise workers) as early as 1951, but were abolished during the Cultural Revolution.[5] In the mid-1980s contributory PAYG pensions (managed by decentralized social insurance agencies) were re-introduced for new urban enterprise workers and extended to all urban enterprise workers in 1991. Then, in 1997 a national pension insurance system for all urban workers was introduced to replace and extend the previous decentralized schemes. Pension arrangements were then introduced for rural workers in 2009 and extended to 'other' urban residents (such as migrant workers, workers in the informal sector and the unemployed) in 2011. A goal in the current national five-year plan is to 'achieve full pension coverage for urban and rural workers and to improve the social security system for the elderly'[6].

[5] Details of the pre-1997 schemes can be found in Salditt et al. (2007, 2008).
[6] State Council (2012) Outline of the Twelfth Five-year Plan for Social Security Development

The broad structure of China's retirement system is summarized in Table 1. A key feature is that schemes differ by sector. There are four different schemes covering (1) Civil servants and public sector workers; (2) urban workers; (3) rural workers; and (4) urban residents not covered by the urban scheme. There are about 40 million public sector workers, around 300 billion urban workers, 300 billion rural workers and around 170 billion migrant workers. Depending on their exact circumstances, the migrant workers could be covered by either of the urban, rural or urban resident schemes. The specific characteristics of the retirement income arrangements for each of these four sectors are discussed next with focus on three key components – social assistance, income replacement and arrangements for voluntary retirement saving (if any).

<*insert Table 1*>

Pensions for civil servants and public sector workers

Public sector workers and civil servants are covered by a stand-alone scheme dating back to 1955 (Leckie 2011). Income replacement for public sector workers (which more specifically includes civil and public servants) is achieved through a non-contributory defined benefit pension, financed by the relevant state or the public sector employers. Coverage is around 100 per cent and replacement rates increase in line with years of service. While the exact rules are quite complex, 10 or fewer years of service will deliver a replacement rate of around 50 per cent, with a maximum replacement rate of around 90 per cent achieved after 35 years of service. The benefits are provided at a retirement age of 60 for men, 55 for female cadres and 50 for female workers after 10 years continuous service[7]. Pension scheme unification is now a national policy goal. The aim is to progressively assimilate with the design of the urban pension scheme – whereby both workers and employers would be required to make contributions and replacement rates would be reduced. The gap between the current pension benefit and the reduced benefit would be filled by voluntary schemes similar to the Enterprise Annuity (EA) currently offered to urban workers. Pilot reforms are already underway in at least 5 provinces/municipalities (Chongqing, Guangdong, Shanghai, Shanxi and Zhejiang) (Leckie 2011).

Pensions for urban workers

The current pension scheme for urban workers (known as the Enterprise Pension Scheme) dates back to 1997 and is a three pillar arrangement which includes social assistance, income replacement in the form of a pension funded by mandatory employer and employee contributions and a voluntary Enterprise Annuity.

[7] State Council Temporary Measures on Workers' Retirement, Resignation [1978] No.104

The social assistance (in the form of a minimum living standard payment) is provided by local governments. However, access to benefits is limited and is targeted to those who do not have an income source, are not capable of working, and do not have adult family dependents capable of looking after them, as well as persons with an income below the minimum living standard (determined at the county/local government level).

Income replacement for urban workers is achieved through two mandatory components. A pay-as-you-go (PAYG) defined benefit (DB) pension funded by a 20 per cent employer contribution, and a state managed individual account funded by an employee contribution of 8 per cent of earnings.[8] The DB pension is subject to social pooling at the provincial or municipal level. The pension is paid at a rate of 1 per cent of the average wage for each year of coverage, subject to a 15 year vesting requirement. The target replacement rate is 35 per cent - that is, an accrual of 1 per cent per year for 35 years. The benefits are paid on a PAYG basis with a large proportion of current contributions used to fund the legacy costs of pensions accrued under pre-1997 schemes.

The 8 per cent employee contribution is paid into an individual account and is designed to be fully funded with the retirement accumulation calculated as a function of the contributions made and a notional (low) interest rate. The monthly benefit from the individual account is calculated as retirement accumulation/139, and is expected to provide a replacement rate of 24.2 per cent. With the employer funded DB pension this translates to a total expected replacement rate from the mandatory components of 59.2 per cent (ie, 35 per cent + 24.2 per cent) for a full working life of contributions. The retirement ages for urban workers are 60 for men and 50 for women[9] (subject to early retirement provisions for arduous work)[10].

The administration of the assets accumulated to fund the PAYG pensions and the individual accounts and the associated asset management take place on a decentralized basis by the local social security bureau (account management) and local finance bureau (investment management), according to national guidelines. Assets are mainly invested in bank deposits and government securities.

Urban workers also have access to an Enterprise Annuity (EA), which is offered by employers on a voluntary basis. An EA is a fully funded DC plan into which employers can contribute up to 5 per cent of wages on a tax free basis. So far take-up has been quite limited. In 2012 only 6 per cent of workers participating in the urban scheme held EAs. It has been suggested that inadequate tax incentives and strict regulation on asset allocation are barriers to participation (Pozen 2013).

[8] Subject to small differences by region.
[9] 55 for women who hold senior management positions.
[10] State Council Temporary Measures on Workers' Retirement, Resignation [1978] No.104

Pensions for rural workers and urban residents[11]

Rural workers and urban residents (who are not salaried workers) also have access to non-contributory social assistance designed to provide a minimum income. These benefits are mainly financed by local governments, with some support at the provincial and central government level, and target all in need, not just the elderly. Benefit levels differ by region, reflecting both the fiscal position of different localities and differences in living standards and costs.

Income replacement is provided by the New Rural Pension Plan which commenced in 2009 and the New Urban Residents Pensions Plan introduced in 2011.[12] A specific goal was to extend these schemes to all geographic areas by 2013 and expansion has taken place at a rapid pace. By early 2012 the new rural pension scheme had more than 250 million contributors and more than 100 million in receipt of basic pensions (Dorfman et al. 2013a). The two schemes share the same broad structure comprising two components: a basic pension financed by local and central government (through social pooling) and a (voluntary) personal account.

The basic pension payment is a non-contributory flat rate payment of ¥55 per month (which can be topped up by local governments from their own revenue) and funded on a PAYG basis. The local government's top-up payment varies considerably. For example, in Beijing, the total benefit is ¥280 per month (¥55 from the central government and ¥125 from local government), ¥200 in Shanghai and ¥100 in Hainan. Financing methods differ between regions: for the central and western provinces the central government funds 100 percent of the cost, but only 50 percent of the cost in the eastern provinces. Benefits are paid from age 60, subject to a 15 year vesting requirement. For those already aged 60 or above when the new schemes commenced, payment of the flat benefit of ¥55 per month is contingent on pension contributions paid by his/her adult children (if any) in an arrangement known as 'family binding'.

The personal account is a voluntary scheme with incentives to encourage participation. Under the rural scheme the voluntary contributions are set at 5 levels from 100 to ¥500 per year and at 10 levels for the urban resident scheme from ¥100 to ¥1,000 per year. The incentives to participate include matching subsidies (of a minimum of ¥30 per year), the 15 year vesting requirement to receive the basic pension and family binding (as discussed above). Lifetime pensions from the individual account are paid at the rate of 'account accumulation'/139 per month from the age of 60 for both men and women. In theory these new schemes allow portability, both to and from the new rural pension scheme and between the rural and urban resident pension schemes.

[11] This section draws on Alonso et al. (2011) and Dorfman et al. (2013a).
[12] Details of the previous rural schemes can be found in Dorfman et al. (2013a).

The assets in the individual accounts are managed by the local social insurance bureaus and the balance is credited with the one-year bank deposit rate. A stated aim is to shift this responsibility to the provincial level as soon as possible.

National Social Security Fund (NSSF)

The NSSF was established in 2000 as a means of insuring against the fiscal pressures associated with an ageing population. The inflows come from four sources: fiscal transfers from the central government, equity transfers from state share sales in SOEs, national lottery income and investment income. NSSF assets are managed in-house and outsourced to fund managers. In-house investment has been restricted to bank deposits, government bonds, financial instruments with high liquidity and security and the recently included private equity products. Investment management of high risk assets such as domestic equity and mutual funds is outsourced to third parties. While the NSSF has the potential to fund the liabilities associated with future PAYG pensions from the schemes described above, there is no direct link between the NSSF assets and the requirement for fund future pensions. In fact there is no fiscal rule for the NSSF that prevents the Chinese government from using the funds accumulated in the NSSF at its discretion.

Discussion

At first glance the structure summarized in Table 1 and discussed above may suggest that China operates a comprehensive and well developed multi pillar retirement income system with a safety net, mandatory retirement saving (for consumption smoothing) and options for voluntary retirement saving – as advocated by pension experts from international organizations (for example, Dorfman and Palacios 2012). However, a more careful examination identifies issues and concerns relating to adequacy, benefit security and governance. In particular:

- There is no effective safety net for the aged. The available social assistance is a minimal income payment managed by local and provincial governments, and targets the destitute without families.
- The pension arrangements are immature, dating back to only 1997 for urban workers, 2009 for rural workers and 2011 for urban resident workers.
- The pension arrangements are fragmented, with separate schemes for urban workers, rural workers, urban residents and civil servants and public sector workers.
- The system is decentralized, managed by around 2,000 regional pension pools, with no practical means of portability of pension benefits between the pension pools, nor between the four different systems.

- The investment management is unsophisticated with individual account assets invested in low interest bank accounts and government bonds.
- There is minimal transparency with employer contributions largely used to fund the legacy costs of pre-1997 SOE pension schemes.
- There has been extremely low take-up of the voluntary schemes, such as the Enterprise Annuities available to urban workers.
- There is an absence of governance structures for both publicly and privately managed assets.

These deficiencies have not gone unnoticed by academics, policy advisors and pension experts from around the world (see for example, Barr and Diamond 2010; Pozen 2013; Lu and Piggott 2012), and are fundamental to the most recent proposal from the World Bank (Dorfman et al. 2013b), summarised in Table 2 below.

<insert Table 2>

This most recent World Bank proposal advocates a unified multi pillar approach to retirement income provision and aims to address the issues of fragmentation, uneven benefits, limited risk pooling, lack of transparency, low investment returns and poor incentives.

In the following section we assess current pension policy in China, as described above, using standard criteria in pension economics (Bateman et al. 2001). A key contribution we make is to use data from the 2011 wave of the CHF Survey to report the actual experience with current pension policy provisions in terms of coverage and adequacy. A notable feature is the huge difference in retirement status between urban and rural residents (see Figure 6). In particular, retirement is almost irrelevant in the less developed regions in the central and western provinces where many tend not to retire, even at very old ages (see Figure 7).

<*insert Figures 6 and 7*>

4. Assessment of China's retirement income arrangements

Typically retirement income systems are assessed in terms of individual and economy-wide criteria.[13] The individual criteria assess the ability of the retirement income arrangements to insure retirees (or older citizens) against the economic and financial risks they may face at older ages including: coverage risk (the risk of not being covered by a retirement income scheme); replacement risk (the risk of a fall in standard of living in retirement); investment risk (the risk of lower retirement

[13] Criteria informed by Bateman et al. (2001).

incomes due to poor investment management and/or share market movements), longevity risk (the risk of outliving ones retirement assets), inflation risk (the risk that retirement incomes and assets are depleted by inflation), and political risk (the risk that government alters the policy, regulations and implementation details). The economy-wide criteria assess the impact of the retirement income system on overall equity (both inter and intra-generational) and economic efficiency, as well as the administrative efficacy of the arrangements and their ability to generate long term growth. An assessment of the Chinese retirement income arrangements under each of the individual and economy-wide criteria are discussed below and summarized in Table 3.

<*insert Table 3*>

Individual criteria

Coverage risk: From the earlier discussion it is clear that while the Chinese pension system is decentralized and fragmented, its ability to insure against coverage risk is increasing. In the past four years overall coverage has expanded from just urban and public sector workers (and civil servants) to include rural workers and those urban residents not otherwise covered. Coverage of urban workers has increased from 39 per cent in 1998 to 55.94 per cent in 2010 (China Pension Report 2012), and geographic expansion to rural and urban resident workers is being implemented at a rapid pace. The official target is full geographic coverage of the new schemes by 2013 and national coverage of all workers by 2020. According to official figures, by the first quarter of 2012, 376 million people were participating in the new rural and urban resident schemes, with 107 million receiving pension benefits. 16 provinces had achieved full geographic coverage and a further 10 provinces had integrated their rural and urban schemes (China Labor and Social Security News 2012).

However, as illustrated in Figure 8, data from the 2011 wave of the CHF Survey indicates continued differences by sector and region. Coverage is almost universal for public sector workers (and civil servants) and quite high for those in the urban sector with 68 per cent of workers covered by pension plans and 90 per cent of the retired receiving pension benefits. However, both forms of coverage are very low in rural regions.

<*insert Figure 8*>

It is unclear whether the recently introduced rural pension scheme will facilitate higher coverage with its voluntary rather than mandatory participation. As well, the incentives introduced to encourage participation actually encourage delayed rather than immediate participation – such as deferring until age 45 (to satisfy the minimum 15 years vesting requirement) or until parents reach pension age (to satisfy the family binding requirements). As a voluntary scheme there are also

questions about public awareness. Finally, it is likely that migrant workers may be deterred from participation in the urban schemes by the high contribution rates, the 15 year vesting requirement and the lack of portability in practice.

Replacement risk: The ability of the Chinese retirement income arrangements to address replacement risks differs by the particular scheme under consideration. Civil servants and public sector workers are well covered with expected retirement replacement rates ranging from around 50 per cent for workers with 10 years of service to 90 per cent for a full 35 years of service. Urban sector workers are (in theory) covered with a target replacement rate of 59.2 per cent after 35 years of contributions. However, with the low rates of return on the individual accounts (due to investment in low return bank accounts and government bonds) and very low take-up of Enterprise Annuities, it is not clear that the target replacement rate will be achieved.[14]

The retirement incomes provided under the recently introduced schemes for rural workers and urban residents (around half the workforce) are unlikely to provide adequate income replacement for anyone. The flat rate pension pays a minimum of only ¥55 per month (which is only a fraction of average expenditure by retirees) and the likely take-up of the voluntary component is as yet unclear. As noted earlier, the matching contribution is quite low and there is no real incentive to contribute more than the minimum or beyond the 15 year vesting period. As well there are likely to be large differences in benefit level (and adequacy) by region, with the eastern wealthier provinces more likely to supplement to minimum pension.

Adequate replacement rates are also compromised by the lack of effective portability, the 15 year vesting requirement (which many migrant and therefore transient workers are unlikely to achieve) and the very low investment returns on the individual accounts.

Data from the 2011 wave of the CHF Survey allows us to further explore the adequacy of publicly provided pensions and their role as a source of income in retirement. Figure 9 reports the main source of income, for retirees age 50 and over in 2011 and reveals large differences by sector. Almost all retirees from the public sector rely on the state pension (the non-contributory scheme for civil servants, veterans and employees of SOEs prior to the post 1997 pension reforms). However, almost two thirds of CHF survey respondents in rural areas report that family (children and other family members) will provide their main source of income. 22 per cent of survey respondents report reliance on own savings and earnings in retirement. In urban areas, 35 per cent rely on family

[14] The system is only 16 years old, so there is no experience of the likely payouts for contributors with a full working life of contributions.

support and own savings, and the majority (54 per cent) report public pensions as their main source of income in retirement.

<*insert Figure 9*>

Furthermore, for those who do receive a pension, the average benefit payment differs significantly by sector and region as illustrated by CHF Survey (2011) data reported in Figure 10. In particular the amount of rural pensions, whether in the western, middle or eastern regions, are not only paid way below the pensions for urban and public sector retirees, but also well below the poverty line.

<*insert Figure 10*>

Investment risk: The current design of the four schemes which make up the Chinese retirement income scheme means that there is little (or no) exposure to the share market. The public sector benefits and the flat rate rural and urban resident pensions are centrally funded and the urban sector DB pensions are funded on a PAYG basis. The individual accounts in the urban scheme are invested in low return assets such as bank accounts and government bonds, which have yielded average returns of only 2 per cent in the past 10 years (far below the annual rate of inflation). As well, the personal accounts in the rural and urban resident scheme accumulate at the one-year deposit rate. However, while the coverage of Enterprise Annuity is very low, these retirement savings vehicles are allowed to invest up to 50 per cent in corporate bonds and 30 per cent in domestic equities. In sum, it is possible that the investment risk is that returns are too low (not too volatile as is the case elsewhere). Pozen (2013) suggests that greater use should be made of the NSSF which has appropriate expertise and is allowed to invest in foreign securities.[15]

Longevity risk: Longevity risk is the risk that retirees will outlive their retirement income. Under the fragmented Chinese pension system, all schemes except the Enterprise Annuity pay benefits for life. However, as noted earlier there may be gaps in the coverage and level of benefit payments. As well, the financial pressures due to demographic transition could leave the 'lifetime' benefits paid from the publicly managed PAYG DB schemes vulnerable to political risk, as has been the case in much of the developed world which has seen widespread reductions in public pension benefits (OECD 2011).

Inflation risk: The coverage of the Chinese pension arrangements against inflation risk is mixed, and depends on the specific scheme under consideration. While none of the schemes include automatic indexation (for either/or inflation or wages) the government can and does increase benefits at its discretion. In fact this is the ninth consecutive year that the government has increased the pension

[15] Pension assets are being invested by the NSSF in a pilot program in Guangdong province.

for urban workers.[16] However, under the schemes for rural workers and urban residents the basic pension is paid at a flat rate at ¥55, and while the guidelines note the importance of adjustments to the basic pension, the basic benefit of ¥55 has not changed since its introduction in 2009, despite annual inflation of 5-6 per cent. Furthermore, for the pensions paid from the voluntary individual accounts, indexation is 'to be set in accordance with economic development and changing prices'.

Political risk: Political risk refers to the risk that the government may change the rules and regulations associated with the pension arrangements Public PAYG retirement income arrangements are at their most vulnerable to political risk during demographic transition when the proportion of the dependent elderly population increases rapidly relative to the working population. This raises concerns for the publicly funded pensions for civil servants and public sector workers, the PAYG pensions in the urban sector and the flat rate pensions in the new rural and urban resident schemes. As well, irrespective of population ageing, there are design and implementation issues associated with the administration, investment management and governance of the publicly managed pension pools and individual accounts. Key issues of concern include the high proportion of 'empty' individual accounts in the urban scheme, and the generally low rates of return in all publicly managed individual accounts.

Economy-wide criteria

The economy-wide criteria include equity (both intra- and inter-generational), efficiency (in terms of the ability of the retirement income system to facilitate increased saving and labour market participation), administrative efficacy (and institutional capability) and the ability to generate long term growth. An assessment of the current pension arrangements against these criteria is discussed below and summarized in Table 3.

Equity: Intra-generational equity of pension provision in China has been enhanced with the recent introduction the social assistance and the new schemes for rural workers and urban residents (albeit at very low pension amounts). However, it is clear from the earlier discussion that both pension benefits and coverage differ substantially by scheme type (see Figures 8, 9 and 10). The data in these Figures clearly illustrates the implications of a pension policy where civil servants and public sector workers receive replacement rates close to 100 per cent, while the new schemes for rural workers and urban residents pay flat rate pensions of just ¥55 per month. The low benefits for workers outside the urban and public sectors may be further reinforced where the 15 year vesting period is not achieved, and where mobile (mainly migrant) workers cash out benefits prior to retirement.

[16] Usually by an amount between price and wage inflation.

Furthermore, inter-generational equity is of particular concern given the reliance on PAYG and central government funding for all four schemes combined with the rapid population ageing and the consequent pressures on government finances.

Overall, the current pension arrangements do little to enhance intra generational equity and are likely to place significant financial pressure on future generations.

Efficiency: Nor is it not clear that the Chinese pension system as it currently operates will enhance economic efficiency. Labour market flexibility is compromised by the decentralized design involving around 2,000 separate funding pools, which combined with the household registration system, restricts the portability of not only age pensions, but also accessibility to health, education and other forms of government benefits to those who work outside their household registration district. This is of particular concern and is a key motivation for recent reform proposals from the World Bank and others (Barr and Diamond 2010; Dorfman et al. 2013b). As a growing economy, China needs to improve the mobility and flexibility of its labour force, particularly with the withdrawal of the demographic dividend. Other design features which are likely to inhibit labour force participation include: the long vesting period of 15 years, the high contribution rates which when combined with other social insurance contributions act as a disincentive to hire workers, and the low statutory retirement ages relative to life expectancy. For example, the retirement ages for the urban pension scheme were set in 1950 at 60 for men and 55 for women. Since that time, average male life expectancy (at birth) has increased from 44.6 to 72.4 and for females from 44.6 to 77.4).

Similarly, the retirement income system as currently implemented is unlikely to make a substantial contribution to national saving. The social assistance schemes, pensions for civil servants and public sector workers, and the basic pensions under the rural and urban resident schemes are all non-contributory and paid from current government revenue. And, while the urban pension scheme is funded by a 20 per cent employer contribution, the benefits are currently paid on a PAYG basis, with a large proportion of these contributions used to fund legacy costs – that is, benefits from previous (now closed) pension schemes. Furthermore, most local governments have found the social pooling contributions insufficient to pay both current benefits and the legacy pensions and have 'borrowed' from the individual accounts. Some estimates suggest that the shortfalls in the individual accounts are around 90 per cent. Therefore, a very large part of the pension system actually operates on a PAYG basis. All of these issues will magnify over time as the population ages and workers are replaced by retirees.

As well, the extent to which the voluntary and privately managed aspects of the pension system will contribute to (or detract from) national saving. That is, to what extent will China's retirement savers

take-up the voluntary Enterprise Annuities under the urban scheme and the voluntary contributions under the new rural and urban resident schemes, and to what extent will these programs lead to new saving (or just a substitution with current saving)? Experience from the developed world suggests low take-up of voluntary schemes due to complexity and behavioural influences (Mitchell and Utkus, 2004). A final issue relates to the poor investment returns evident for individual accounts, both publicly and privately managed.

Administrative efficacy (including institutional capacity)

The administrative efficacy and institutional capability of the current pension system is poor. As noted earlier, the Chinese pension system is fragmented across four sectors, with responsibility for different components spread between different levels of government (and the responsibilities of each level differing by scheme). The financing is largely managed at the level of the local government in around 2,000 pension pools, which provides little opportunity for risk pooling. There is no (or little) centralized record keeping, and the financing and administration is also largely conducted at the provincial and municipal level. As well, the rapid growth of the recently introduced rural and urban resident schemes raises questions about the extent of local capacity and expertise to manage accounts, invest assets and pay benefits.

Capital accumulation and economic growth

Finally, the Chinese pension system as currently designed and implemented does little on its own to facilitate capital accumulation and long term growth. Most employer contributions to the urban scheme are used to fund liabilities from the pre-1997 schemes for urban enterprise workers, while the contributions to the individual accounts are also diverted to fund these legacy costs or are invested in low return government bonds or bank accounts.

For all funded aspects of the current pension system (both publicly and privately managed) the investment channels are very narrow with little access to high return assets. However, this issue is not restricted to pensions. China's capital markets remain reasonably undeveloped and investment options for the general population are limited. Pozen (2013) argues that collaborating between the pension pools and the NSSF to invest retirement investments in Chinese stocks and bonds would assist with the development of a long term perspective in China's capital markets.

However, a particular concern with the growth of pension assets, both publicly and privately managed, is the lack of a national framework for the regulation and supervision of the assets and personal accounts. As well, it is possible that the lack of transparency and evidence of 'empty individual accounts' have led to a distrust in the system. As noted in Alonso et al (2011) '.. supervision strength is quite weak. Across the country there are only 11 provinces having

established an independent bureau for fund supervision. There are few specialized institutions to supervise funds at the municipal and state level.'

Overall, the predominance of PAYG funding, the limited role of the private sector and the lack of investment opportunities does little to facilitate capital market developments. This is a concern given the imminent disappearance of the demographic dividend as a source of economic growth. The overall assessment of China's retirement income system against economy-wide criteria is poor (see Table 3).

Discussion

An assessment of the individual criteria – that is, the ability of the pension system to address the economic and financial risks facing individuals in retirement – indicates that benefit levels vary considerably by sector and are likely to be inadequate for many. Funded pensions are subject to investment risk in the form of low returns, and while all schemes include some form of longevity insurance there is no statutory inflation adjustment. A particular concern is the vulnerability to political risk. As currently designed, most of the components of the retirement income system are based on PAYG publicly provided arrangements with inadequate regulation around the governance and investment of the public pension assets[17].

In terms of the economy wide criteria, the fragmented design with huge differences in coverage and benefit levels by sector and by region raise questions about intra generational equity, while the reliance on PAYG rather than pre-funding threatens inter-generational equity, particularly with the rapid ageing of the population and the consequent reduced capacity to pay future pensions. Fragmentation of the schemes and poor design features create disincentives to the supply and demand of labour and inhibit labour mobility. And, the reliance on PAYG financing with little pre-funding and a lack of investment opportunities does little to enhance saving. Rapid growth and decentralized account and investment management is likely to challenge administrative efficacy, while a lack of investment opportunities combined with the absence of governance structures to ensure the productive investment of the publicly managed pension assets limits the capacity of the system to contribute to capital accumulation and long term economic growth. While some of these issues have been addressed by recent policy proposals originating from both within China and elsewhere (Barr and Diamond 2010; Dorfman et al. 2013b) there has been little discussion of the design and implementation of appropriate governance structures to ensure the long term security of pension assets and benefits.

[17] As argued in Ramia et al. (2008).

5. Discussion and conclusion

In this paper we have described and critically appraised China's current pension arrangements and presented relevant demographic trends. Our overall assessment leads us to question whether pension policy as currently designed can cope with a long term scenario of rapid population ageing, withdrawal of family support (due to urbanization and the long term impact of the population policies) and the possibility of lower economic growth (due to the withdrawal of the demographic dividend). Under this scenario, the number of workers for each retiree is projected to fall from 6.1 to 1.6 and there is likely to be competing pressure for public funds, for health and old age care as well as to provide a universal income safety net.

We largely agree with the policy advice offered by academics and international organizations to introduce a national safety net, to centralize the current fragmented design and introduce (where appropriate) notional defined contribution arrangements to increase transparency and improve incentives, and to enhance voluntary participation and the role of the private sector. However, we emphasise that the benefits of pre-funding and any increase in private sector provision are predicated on well-functioning financial and capital markets, an enforceable regulatory structure, good governance of retirement assets and adequate asset returns. As well, any further reform will require close co-operation between central, provincial and local governments, so a systematic system of inter government fiscal arrangements is essential.

In order to beat the demographic clock, the next phase of pension reform should start now.

Acknowledgements

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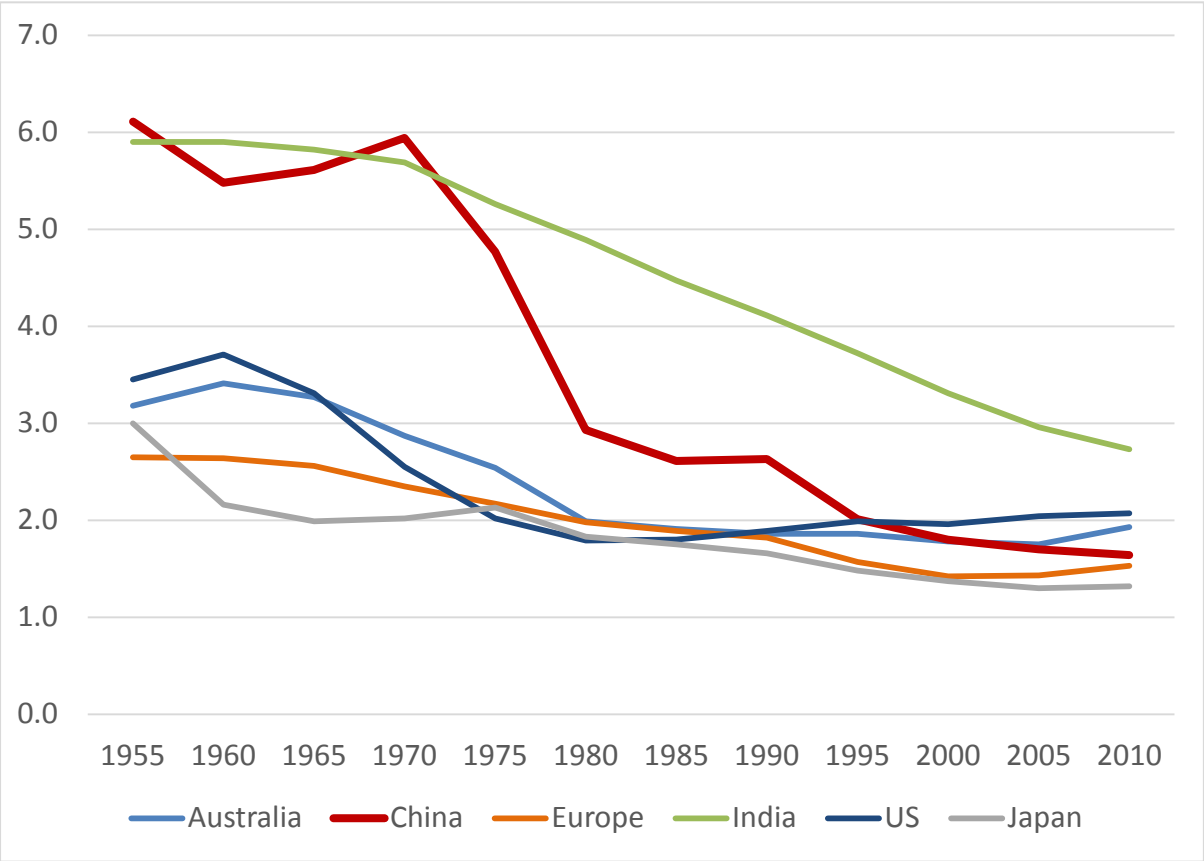
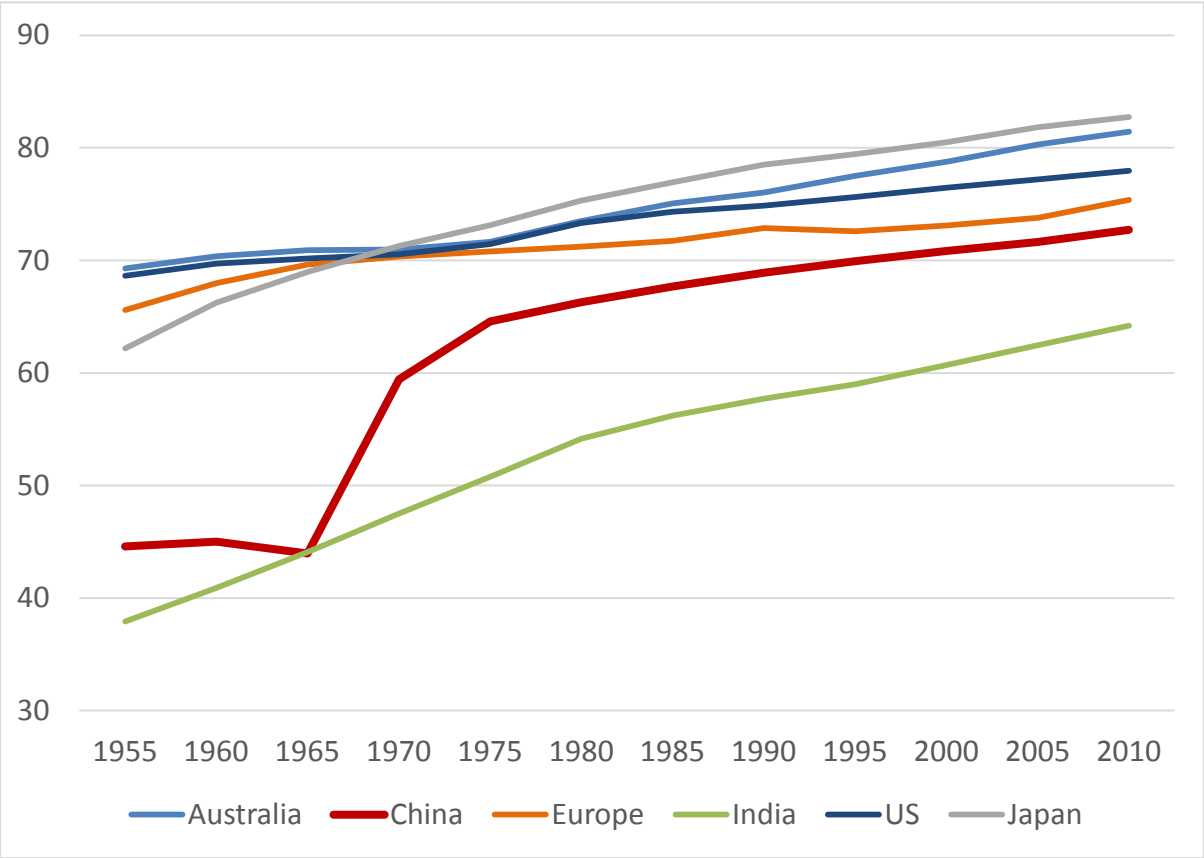
Figure 1: Total Fertility Rate (children per woman), 1950-2010



Source: UN (2013) 'World Population Prospects: The 2012 Revision'.

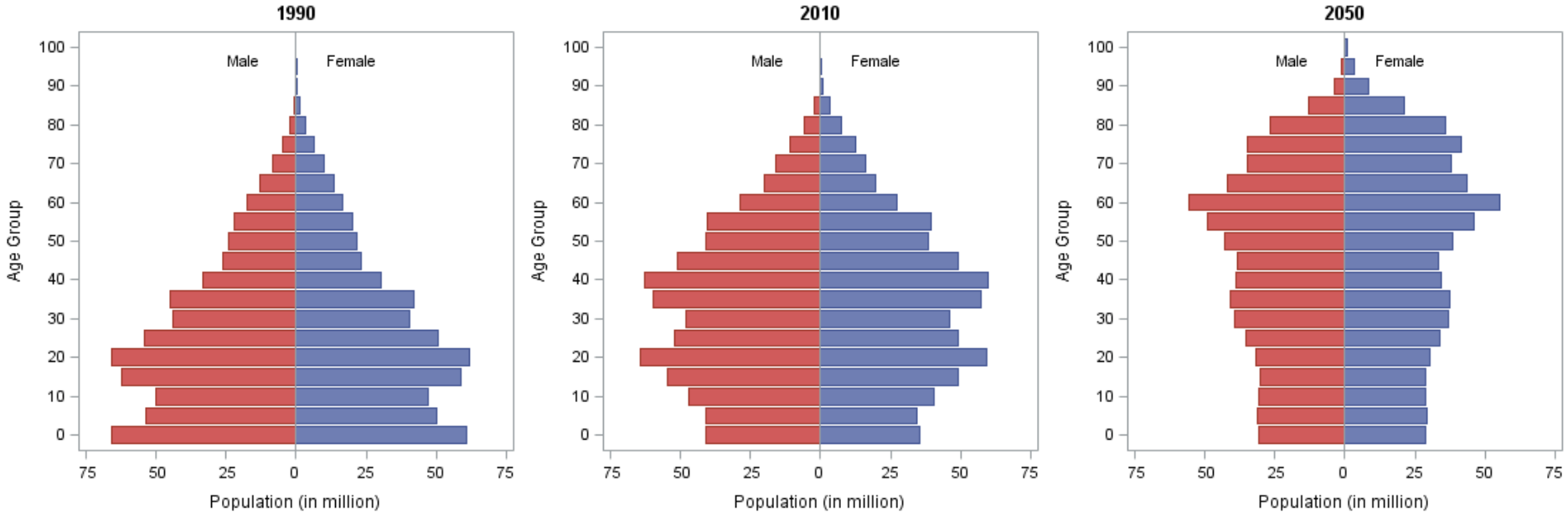
Figure 2: Life expectancy at birth (years), 1950-2010



Source: UN (2013) 'World Population Prospects: The 2012 Revision'.

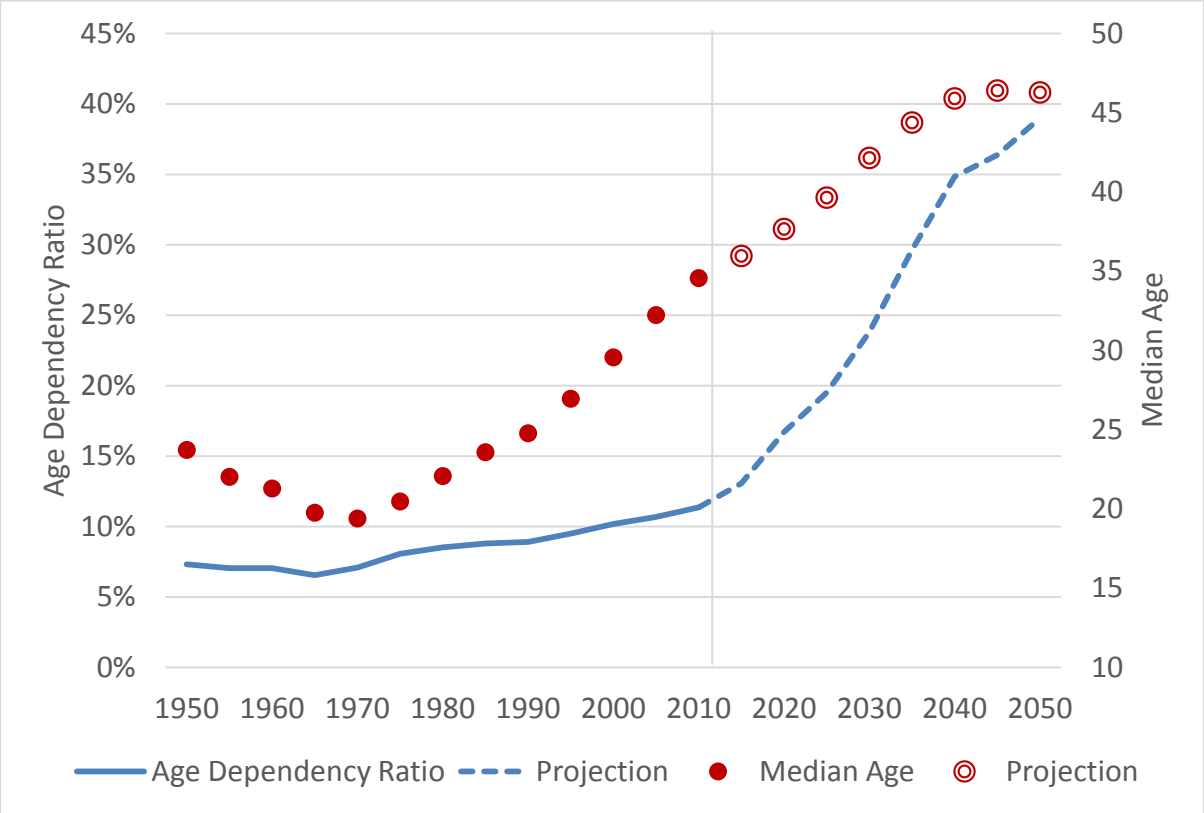
Figure 3: Population profile by age and gender

Population pyramid, China (1990, 2010, 2050)

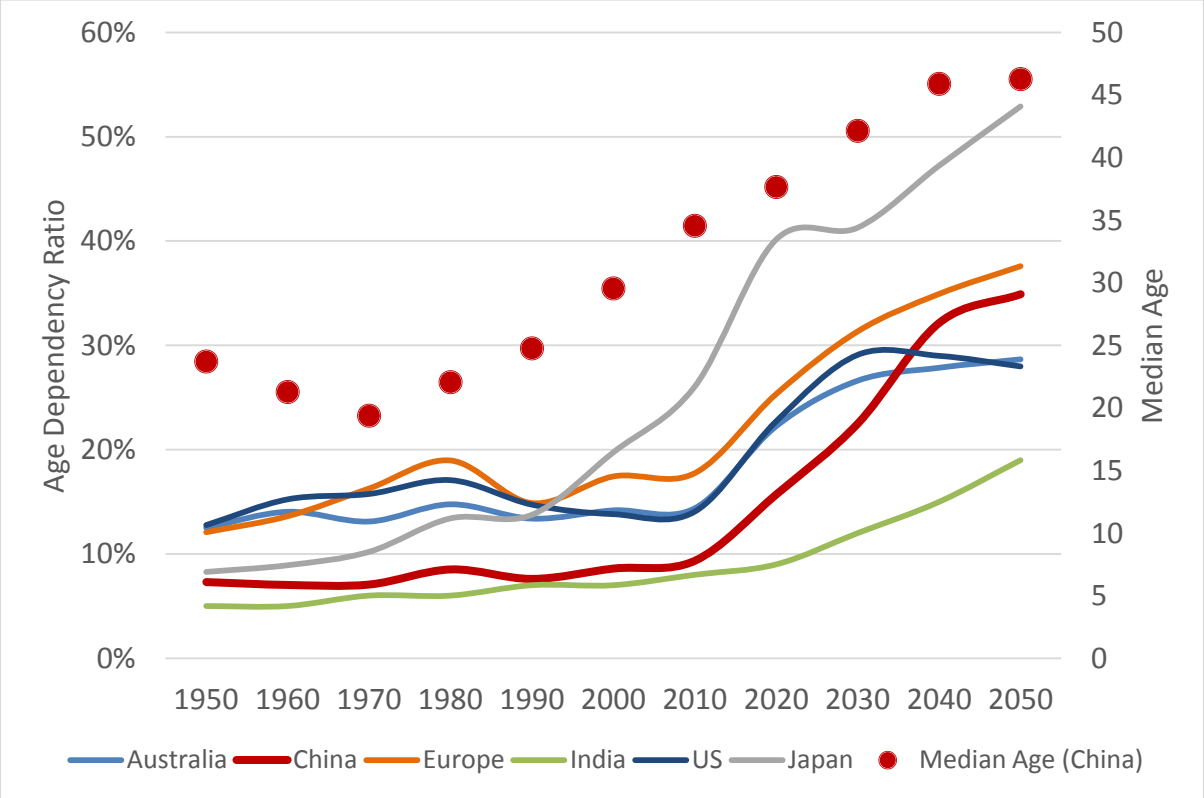


Source: UN (2013) 'World Population Prospects: The 2012 Revision'.

Figure 4: Age dependency ratio (pop aged 65+ as percentage of pop aged 15-64) and median age, 1950-2050

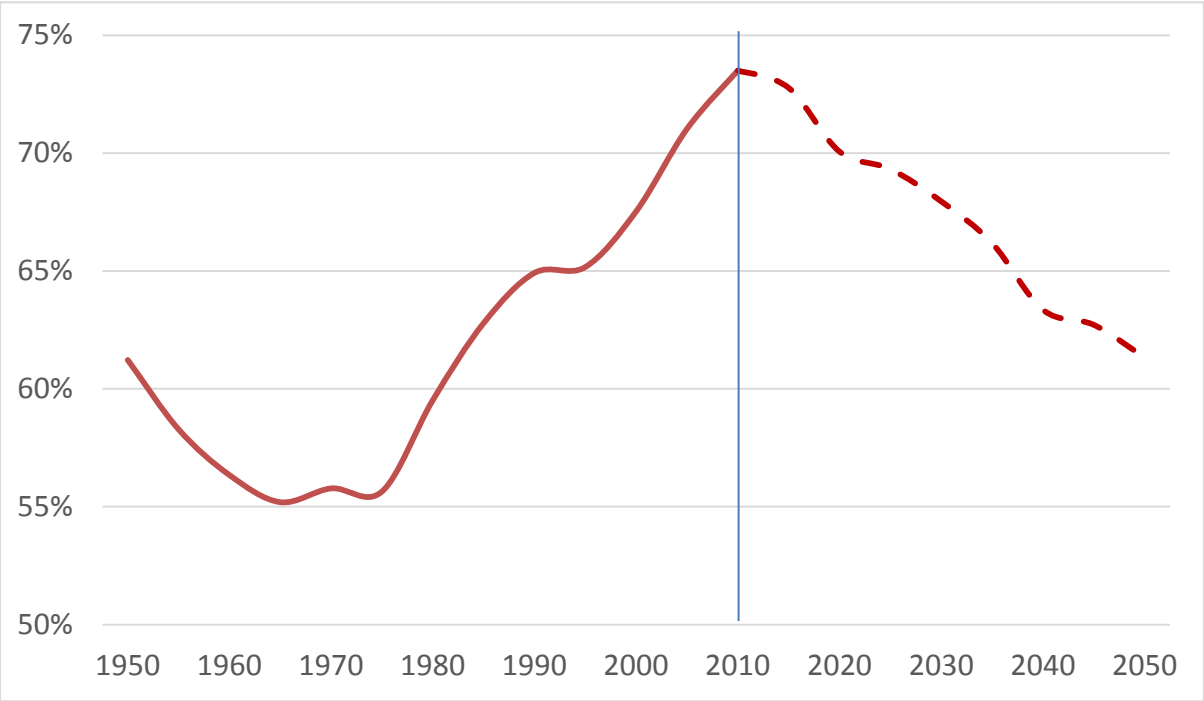


Source: UN (2013) 'World Population Prospects: The 2012 Revision'.



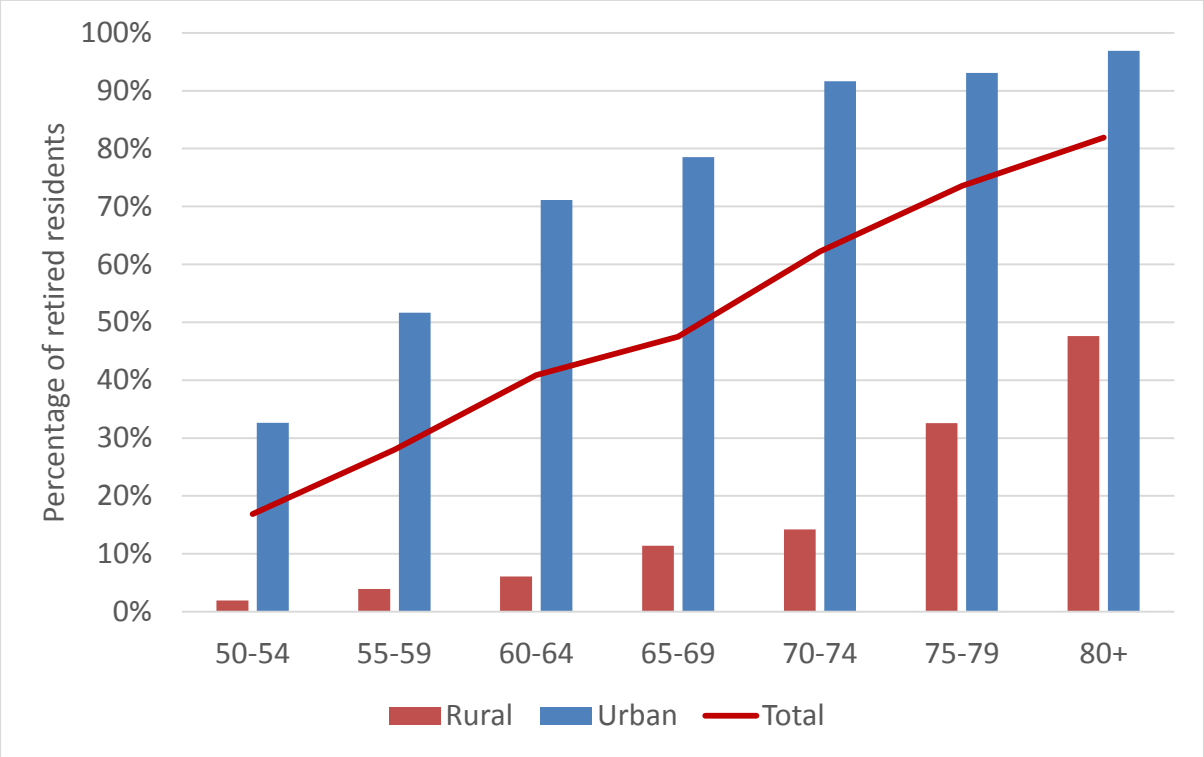
Source: UN (2013) 'World Population Prospects: The 2012 Revision'.

Figure 5: Working-age as proportion of total population (per cent), 1950-2050



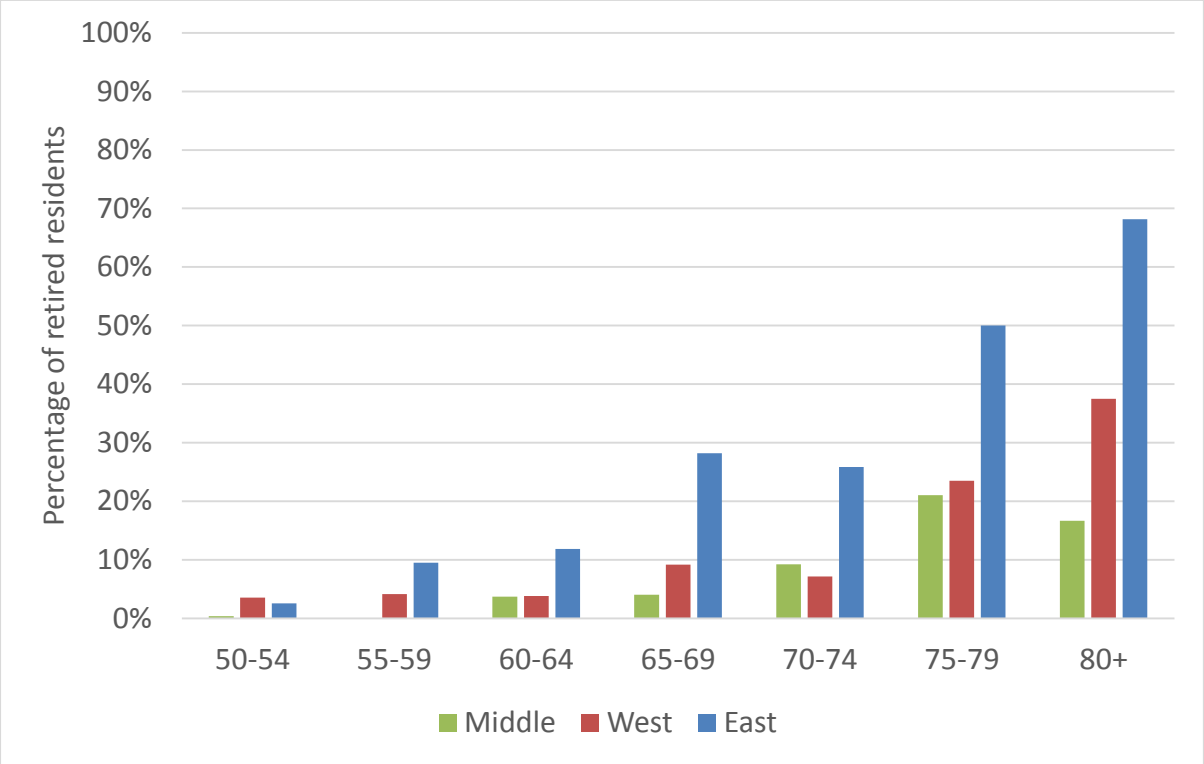
Source: UN (2013) 'World Population Prospects: The 2012 Revision'.

Figure 6: Retirement status by age and region of residence (2011)



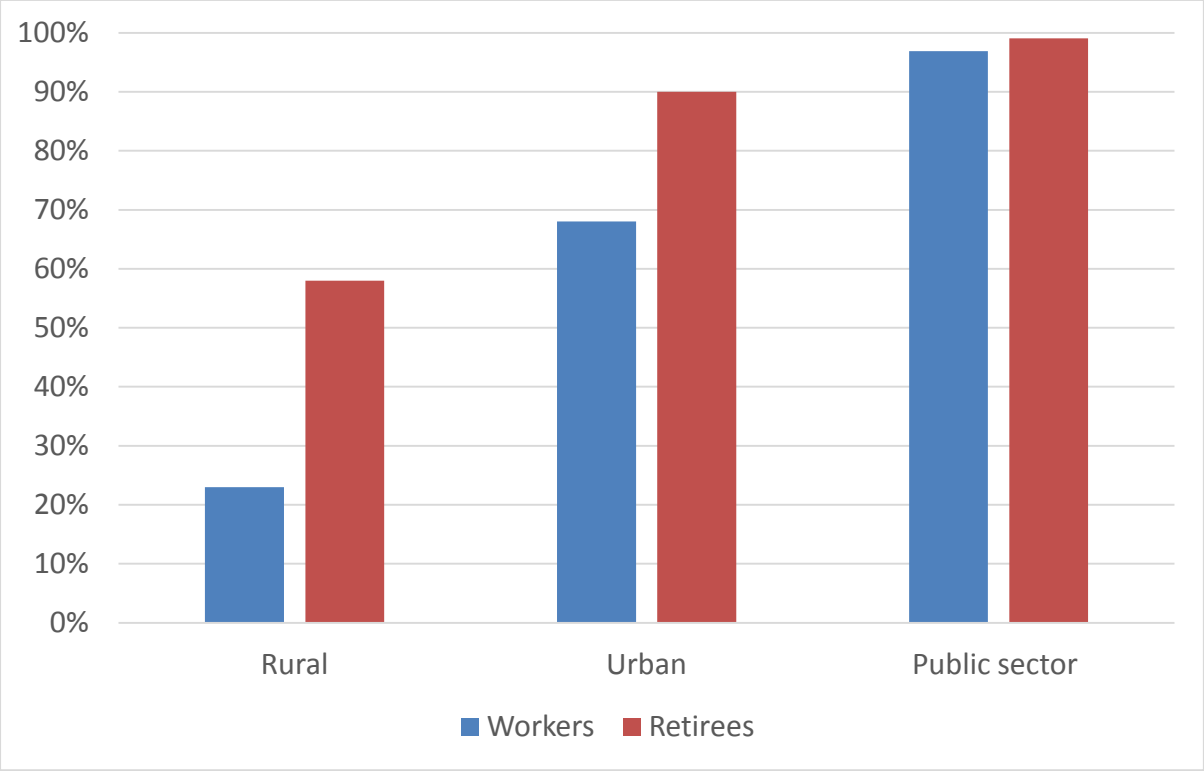
Source: China Household Finance Survey, 2011.

Figure 7: Retirement status in rural areas, by age and region (2011)



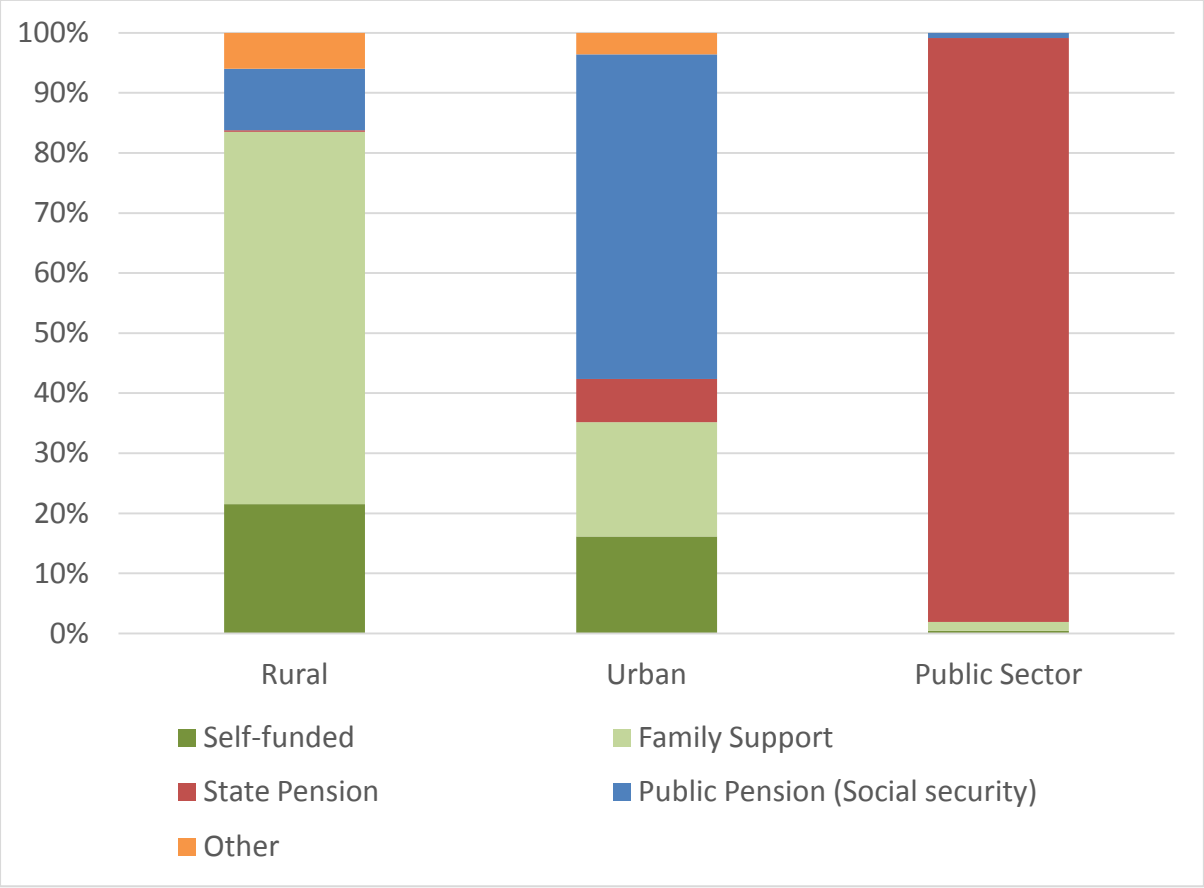
Source: China Household Finance Survey, 2011

Figure 8: Pension coverage by scheme (2011)



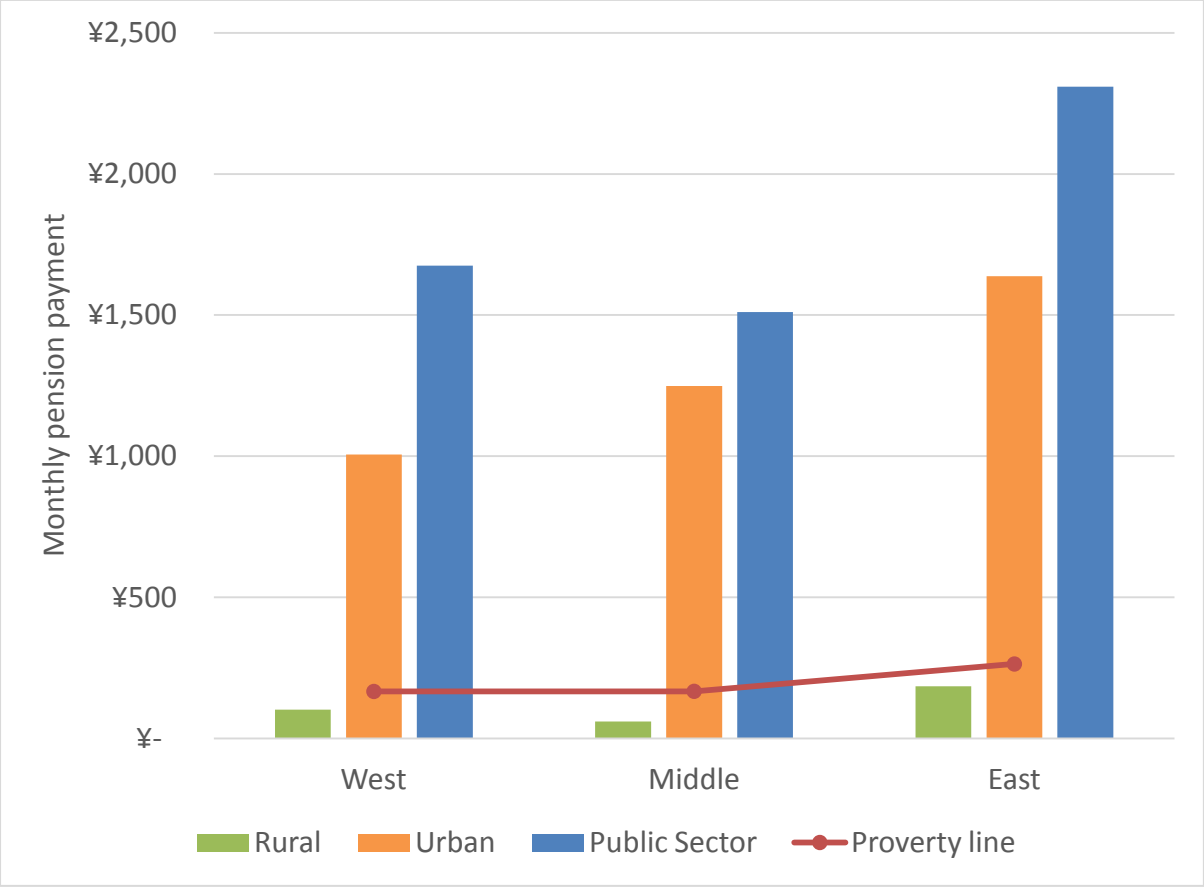
Source: China Household Finance Survey, 2011.

Figure 9: Main source of retirement income by sector (retirees aged 50 and over, 2011)



Source: China Household Finance Survey, 2011.

Figure 10: Average monthly pension payment by region and scheme, 2011



Source: China Household Finance Survey, 2011.

Table 1: Current structure of retirement income provision in China (2013)

	Urban	Rural	Urban Resident	Civil servants and public sector
Safety net	Since 1999	Since 2007		na
	Social assistance (government budget financed).	Social assistance (mainly financed at local and provincial government level).		na
Income replacement	Since 1997	Since 2009	Since 2011	Since 1955
Legal coverage	All urban workers (except those covered by the urban resident scheme)	Rural residents age 16+ (except students). Voluntary introduction by county	Urban residents age 16+ (except students). Voluntary introduction by county/city	All civil servants and public sector workers
Actual coverage	68% workers 90% retirees	22% workers 58% retirees	na	97% workers 99% retirees
Financing	Public PAYG (social pooling) plus publically managed individual account (IA)	Individual contribution plus subsidies from government/rural collectives	Individual contribution plus subsidies from government	General Revenue (PAYG)
Contributions	Public PAYG: 20% employer contribution. Publically managed IA: 8% employee contribution	Contributions over 5 levels (¥100-500 per year) Government subsidy (match) max ¥30 per year	Contributions over 10 levels (¥100-1,000 per year) Government subsidy (match) ¥30 per year	Nil
Vesting	15 years of contributions	15 years of contributions	15 years of contributions	10 years continuous service
Portability	Yes in theory, difficult in practice	In theory, within and between the rural and urban resident schemes		Yes, within public sector, possible with urban sector

Pension age	Age 60 (men), 55 (female senior managers), 50 (female workers) [1]	Age 60 (men and women)	Age 60 (men and women)	Age 60 (men), 55 (female cadres), 50 (female workers))[2]
Benefits	Public PAYG: 1% of average local wage per year of service, indexed annually to wages/prices IA: accumulation/139 per month Expected replacement rate of 35% + 24.2% = 59.2% after 35 years.	Basic pension[3]: ¥55/month[4] Pension from voluntary contributions: accumulation/ 139 per month[5]	Basic pension[6]: ¥55/month Pension from voluntary contributions: accumulation/139 per month[7]	Around 90% earnings after 35 years.
Funds management	Accounts: managed by local social security bureaus Investment management: local finance bureau Assets: Bank deposits	Basic pension paid on a PAYG basis Personal Accounts: specific account at county level	Basic pension paid on a PAYG basis Personal Accounts: specific account at city level	Benefits paid on a PAYG basis from general revenue
Regulator	MOHRSS	MOHRSS	MOHRSS	..
Voluntary retirement saving	Enterprise Annuities: Limited tax relief. Assets invested and managed by professional financial institutions.	na	na	Nil

Source: Alonso et al. (2011), Dorfman et al. (2013a, b), Leckie (2011), OECD (2011).

[1] Age 55 (men), 45(women) if engaged in arduous work after 10 years continuous service.
[2] Civil Servant Act (2006), s14(87)
[3] Central government pays full basic pension in central and western areas, provides 50% subsidy to eastern areas.
[4] Note child contribution.
[5] Indexation according to economic development and changing prices
[6] See footnote 2.
[7] See footnote 4.

Table 2: China's Pension System – A Vision from the World Bank

Basic benefit pillar	Introduce a universal Citizen's Social Pension (CSP). This would provide a minimum level of protection for the elderly against poverty, be non-contributory and apply equally to urban and rural residents.
Contributory pillar	A mandatory notional defined-contribution (NDC) scheme for salaried workers with labour contracts (ie, modifying the current urban old-age insurance scheme). PLUS A voluntary defined-contribution pension savings scheme for urban and rural populations with nonwage incomes – such as temporary workers, the self-employed and farmers (ie, current members of the rural and urban resident schemes).
Supplementary savings pillar	Voluntary occupational and individual pensions for urban and rural residents.

Source: Dorfman et al. (2013b).

Table 3: An assessment of retirement income provision in China

	Urban	Rural	Urban Resident	Civil servants and public sector
Individual criteria				
Coverage risk	Improving	Increasing coverage	Increasing coverage	Yes
Replacement risk	Target 59.2% replacement rate	No. Below poverty line	No. Below poverty line	Around 90% replacement rate
Investment risk	Low returns in Individual Accounts	Low returns in personal accounts	Low returns in personal accounts	Na
Longevity risk	Yes, except Enterprise Annuities	Yes	Yes	Yes
Inflation risk	Partial	No	No	Yes
Political risk	No – DB PAYG pensions. Publicly managed assets.	No – central and local government funding. Publicly managed assets.	No – central and local government funding. Publicly managed assets.	No – publicly funded
Economy-wide				
Intra generational equity	No, very large differences in actual expected benefits and coverage by sector and region			
Intergenerational equity	Vulnerable to intergenerational inequity due to reliance on PAYG and central/local government funding with a rapidly ageing population			
Efficiency (labour market)	Poor labour market flexibility due to system fragmentation, poor portability, high contribution rates, long vesting periods (in conjunction with household registration system)			
Efficiency (saving)	Benefits to national saving Inhibited by reliance on PAYG funding, lack of investment opportunities			
Administrative efficacy	Challenges due to decentralisation, lack of expertise, system differences between roles of central and local governments			
Capital accumulation	Limited capacity to enhance capital accumulation: lack of pre-funding, poor investment opportunities, undeveloped governance structures			