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## The Notional and the Real in China's Retirement Reforms

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# The Notional and the Real in China's Retirement Reforms

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## ABSTRACT

This paper discusses the potential expansion of the role of the Notional Defined Contribution paradigm in the ongoing reforms of retirement provision in China. China has remarkably high nominal retirement coverage of its population. At the same time, however, issues of sustainability, equity and governance are challenging and real. Further, while many broad policy guidelines are set by the central government, jurisdictions at other levels – provincial, city and sometimes even district – have major control over implementation, covering administration, benefit rates, and other important features of retirement policy.

Retirement policy and provision, under whatever approach or approaches that are adopted, are necessarily shaped by the labour market experience of fund members. In China, heterogeneity is dramatic across provinces, and between urban and rural settings, in development stage, cost of living, formalisation level, and other characteristics. Interestingly, we find that mature age life expectancy is remarkably uniform. The variation in life expectancy at 60 is less across provinces than it is between men and women nationally.

We conclude that while an increased presence of the NDC paradigm has the potential to increase aggregate welfare, especially in the large and active Urban Employee Pension Scheme (UEPS), sub-national heterogeneity limits the applicability of any universal pension system in China. In particular, some form of more traditional vesting may serve to enhance formal labour force participation, supporting China's future growth.

## The Notional and the Real in China's Retirement Reforms

This paper discusses the potential role of the Notional Defined Contribution (NDC) paradigm in the ongoing reforms of retirement provision in China, in the context of the continuing growth and development of one of the world's largest economies.[1] China has remarkably high nominal retirement provision coverage of its population. Four separate pension systems, and a (non-age-specific) minimum living allowance ("Dibao") combine to offer financial support for people in the later stages of their lives. At the same time, however, issues of sustainability, equity and governance are challenging and real. While coverage is very comprehensive, benefit levels for some major plans are very low. Further, while many broad policy guidelines are set by the central government, jurisdictions at other levels – provincial, city and sometimes even district – have major control over implementation, covering administration, benefit rates, and other important features of retirement policy. Economic and social conditions vary dramatically between these administrative regions, and there are serious limitations around the extent to which effective centralisation can be achieved.

The NDC paradigm is already effectively embodied in one part of the most important contributory plan, the Urban Employee Pension Scheme (UEPS), although it is not so labelled. Currently, a mandatory 8% contribution by employee within the UEPS is paid into an "individual account", supplementing a Defined Benefit (DB) supported by a 20% employer contribution, which is the scheme's heart. Although these individual accounts were originally conceived to be pre-funded, the fiscal pressures in the retirement space in China have meant that they have remained "empty" almost since their inception.

There is ongoing policy debate about how to improve what exists. Retirement policy and provision, under whatever approach or approaches that are adopted, are necessarily shaped by the labour market experience of fund members. In China, labour market heterogeneity is dramatic across provinces, and between urban and rural settings, in development stage, cost of living, formalisation level, and other characteristics. In this sense, China might be viewed as multiple countries.

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[1] The NDC paradigm is well explained by Ayuso et al (2017), Barr and Diamond (2011), Boskin el al (1998), Holzmann (2017), Holzmann et al (2005, 2012, 2017) and Lu et al (2008). It is not further elaborated here.

An expanded NDC paradigm has previously been recommended for China. It was the centrepiece of the commissioned review by Barr and Diamond (2010). More recently, Zheng (2012) has provided projections of a "hybrid" DC model, replacing the current UEPS, which embodies many of the ideas behind the NDC paradigm, although the projections themselves, which assumed convergence to a reformed system by 2020, have been largely overtaken by events, or rather, non-events. A further paper (Oksanen 2012) provides an excellent overview of proposals up to that time.

Zheng et al (2015) have produced a thorough NDC proposal, which includes projections under a range of policy scenarios. The Zheng et al proposals are summarised in Appendix A. Barr and Diamond (2010) recognise that moving to a true national system involves a major power shift away from local officials and a geographic redistribution of costs and benefits, but otherwise pay little detailed attention to the institutional constraints that China confronts. Zheng et al (2015) do not seriously consider complementary social support for those whose earnings capacity has been exhausted, and which would need to be part of any comprehensive NDC-based reform.[2]

The contribution of the present paper is therefore threefold. First, it provides a thorough documentation of the existing pension policy landscape, and explains the demographic and institutional constraints within which any pension plan in China must operate. Second, it offers stylised projections of benefits, coverage, and liabilities of alternative policy scenarios which expand the NDC system within the UEPS. Third, it examines the costs of alternative retirement-based social support mechanisms. We then discuss how the costs of pensions in the future might be managed under an NDC paradigm, taking into account the cost of a social pension, and consider the impacts of an exclusive NDC paradigm on formal labour force participation.
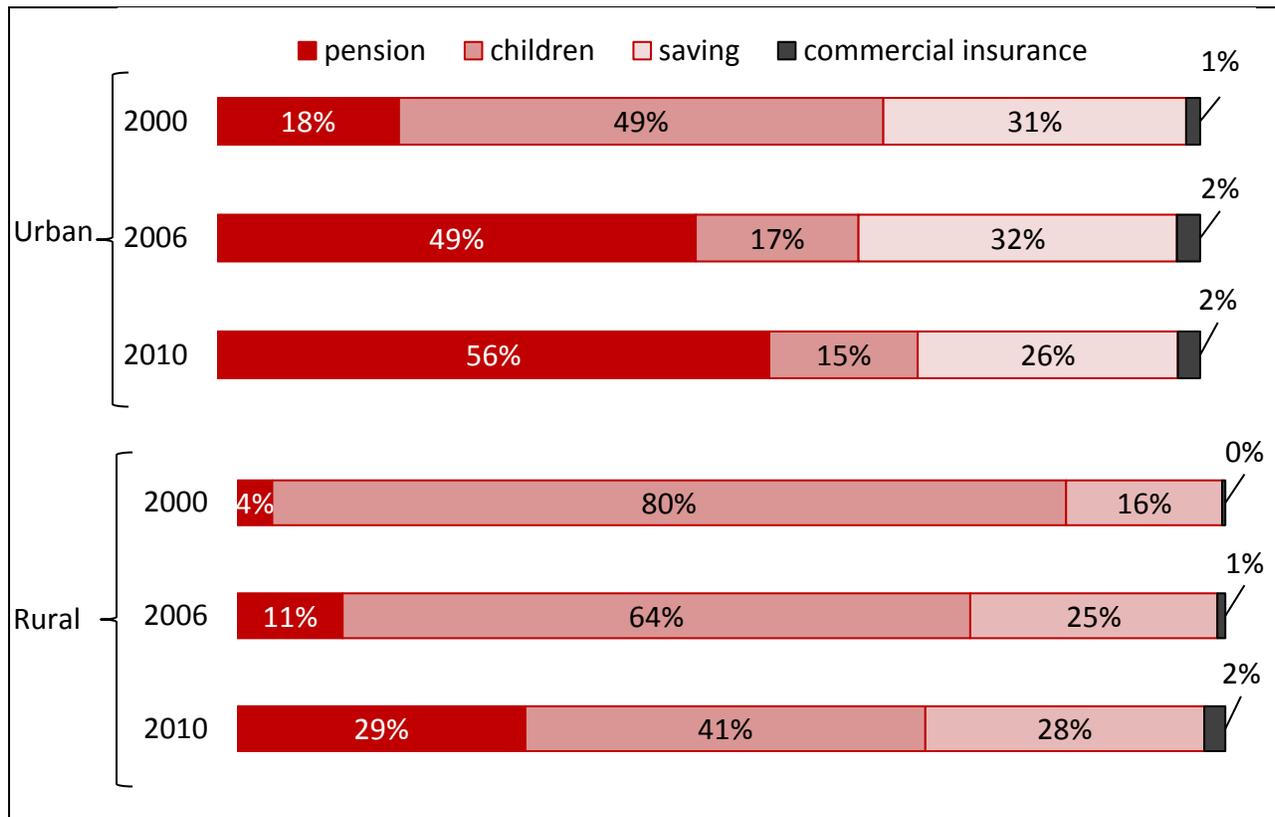
We conclude that an expansion of the NDC paradigm within the UEPS could be welfare improving. While the NDC paradigm has advantages in terms of sustainability and mature labour supply incentives, it also exposes the individual to risks which, given this paradigm, can only be covered by a social pension. Overall costs of reform are therefore greater than those associated with the NDC paradigm alone.

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[2] Zheng et al (2015) do suggest a minimum pension of 5% of the national average wage. But they do not consider those who are not eligible for the UEPS pension.

## 1. China's retirement and pension landscape

Traditionally, most support in later life for most Chinese came from self-provision and family. At the beginning of this century, less than 20% of the urban population aged 60 and above listed "pension" as their main source of retirement income, and in the rural sector, the proportion was less than 5%. This is changing rapidly. By 2010, more than half the urban group listed "pension" as the main source of retirement income, and nearly one third of rural residents did the same. Figure 1 refers. This provides a pension take on both the rapid growth of China, partly through formalisation of its workforce, and its rapid ageing. These are the underlying economic forces which lend urgency to pension reform in China.

**FIGURE 1. Main source of retirement income**



*Source: Authors' summary from three waves of Sample Survey of the Aged Population in Urban/Rural China in 2000, 2006 and 2010, conducted by the National Ageing Committee.*

The centrepiece of China's retirement provision policy is the UEPS. Established in the late 90s, as State Owned Enterprises (SOEs) shed their "cradle to grave" obligations, it currently has a

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membership of about 350 million workers and retirees. In common with many emerging economies, China also has a generous, non-contributory and unfunded Public Sector Pension Scheme, although this is undergoing major reforms. Third comes the "Enterprise Annuity" scheme, which is essentially a Defined Contribution (DC) plan for high income individuals. Finally, over the last decade, two inter-related plans targeting those who have no other pension affiliation have been established – the Rural and Urban Resident Pension.

Table 1 lays out the essential characteristics of these four plans. In terms of aggregate revenue flows, the UEPS is by far the largest plan. The overall contribution rate of 28% is split between employers and employees, with the latter making an 8% contribution to the "individual account". The pure PAYG DB component of the UEPS relies on a contribution of 20% of the scheduled wage to deliver a retirement income of about 35% of the scheduled wage after 35 years contribution. The individual account is estimated to deliver a further 24.5%, delivering a total of about 60% of the scheduled wage.[3] Benefits are calculated according to a benefit formula reflecting both wage level and years of contribution. Fifteen years contributions are required to vest. A crediting rate is applied to the individual notional account balance, which was until recently differentiated by province[4]. In 2016, this was set at a uniform 8.6% nationally, approximately reflecting member wage growth. Benefits are available at between 50 and 55 years of age for women, and at 60 for men, although there are various exemptions for specific occupations granting earlier benefit access. No earnings test applies.

The UEPS is coming under increasing stress as lifetimes expand, and an important piece of the ongoing reform debate revolves around increasing the access age, or retirement age. This has been under review for some time, but thus far no final decision has been made.

The Public Sector Pension, while embracing only a small membership, is probably the next most important, if only because of its generosity. A non-contributory scheme, it pays a full career civil servant between 80 and 90% of final wage, typically indexed to wage growth. The scheme has been under review over the last several years, however. Various groups of public sector workers

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[3] What we term the "scheduled wage" is the wage upon which the 28% contribution is calculated. In many cases, the wage used is 60% of the average wage, which is the minimum base for a 28% contribution. Many employers make additional payments to employees which are excluded from the social security calculation.
[4] The "Social Security Law" (section 14) in 2011 authorises that any remaining individual account balance can be inherited if the pensioner dies.

have been separated from the plan and integrated into the UEPS, and civil servants remaining in the Plan who are still working have now (as of 2016) been enrolled in the UEPS, with the organisation of the additional benefit still to be resolved. One possibility is that the government will set up a supplementary occupational scheme along the lines of the Enterprise Annuity plan. This course of action at least makes explicit the additional value of the Public Sector Pension relative to the UEPS.

**TABLE 1. Existing pension schemes**

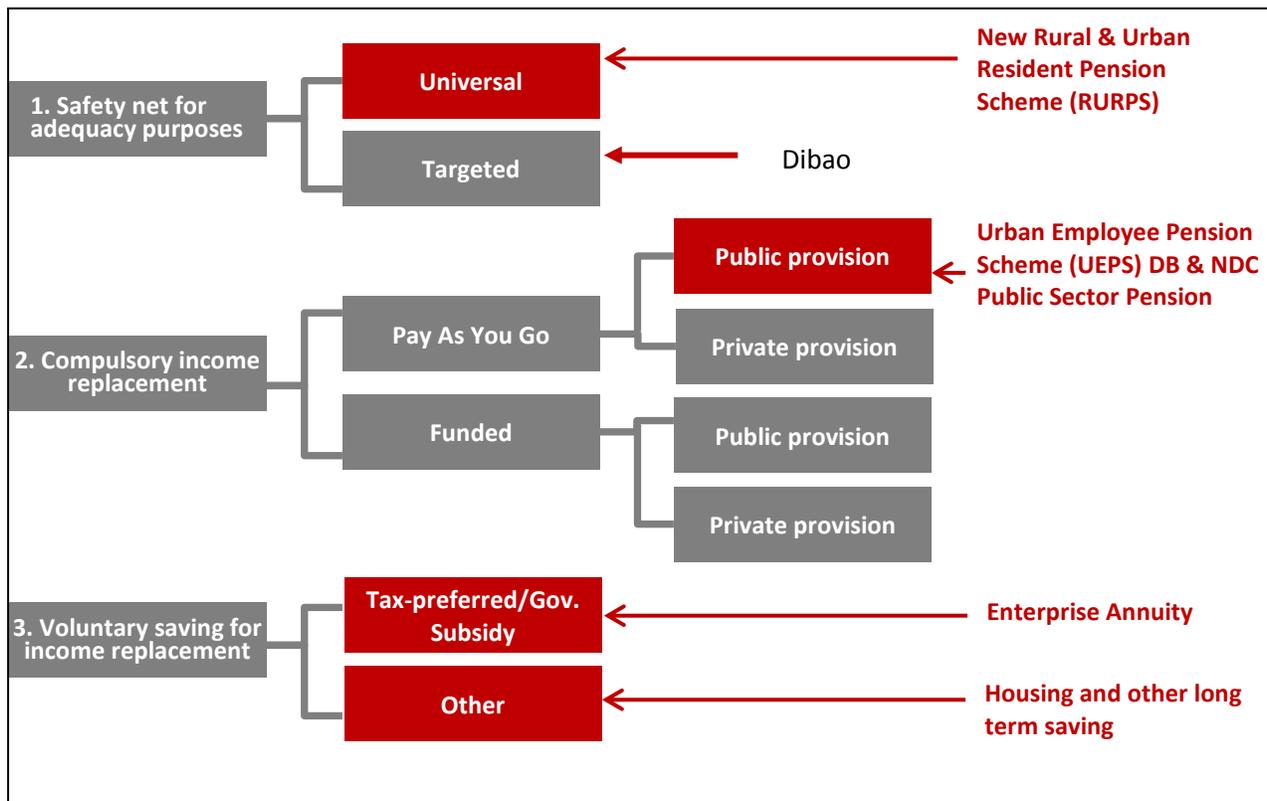| Schemes | Urban Employee Pension | New Rural and Urban Resident Pension | Enterprise Annuity | Public Sector Pension (reformed in 2016) |
|---|---|---|---|---|
| Contribution | 20% of wage to social pooling; 8% to individual account (60-300% of wage base) | RMB 100-2,000 per year | 12% of wage free of tax | No Contribution |
| Benefit | Social pooling: DB formula based on covered years, contribution amount, and local wage. Ad hoc adjustment after retirement. | RMB 70 per month plus annuitized personal contributions by retirement | DC plan | 82-88% of final wage |
| Contributors | 263m | 357m | 22m | 8m |
| % age 15-59 | 28% | 39% | 2% | 1% |
| Pensioners | 91m | 148m | N/A | 9m |
| % age 60+ | 41% | 67% | N/A | 4% |
| Access Age | F50/55, M60 | F60, M60 | F55, M60 | F55, M60 |

*Source: Authors' compilation*

Since 2009, two complementary plans have been introduced which are essentially social pensions, although they have a contributory element. The Rural Residents Plan was introduced in 2009, offering residents over the age of 60 with rural Hukou immediate enrolment and benefits. The scheme instantly became the world's largest pension fund by number of members. The basic benefit was introduced at RMB 55 a month; this has now been raised to RMB70 a month. This is well under USD 1 per day. More prosperous provinces offer supplements which can substantially increase this payment. As well, those under 60 are supposed to pay a minimum of RMB 100 a year in contributions, which will be converted to an additional annuity at age 60. In 2010, a matching Urban Residents pension scheme was introduced, providing cover to people with urban

Hukou who are not members of other pension schemes. We treat these as a single policy, the Rural and Urban Residents Pension Scheme (RURPS)

To offer some sense of the structure and function of this retirement policy, we characterise it in terms of the generic schema in Figure 2, which identifies the functions of a retirement policy as comprising poverty alleviation (or adequacy), compulsory income replacement, and voluntary supplementary lifetime saving. The rural and urban residents' plans are seen as poverty alleviation instruments, tested against other pension resources. They are supplemented by the Minimum Living Allowance ("Dibao"). This is not strictly a social pension, since it is not age-dependent. It is available to those with no significant labour, capital or family resources. It is much more generous than the RURPS, but only a small proportion of those in receipt of the RURPS receive the Dibao. This may be because they hold other resources, or because they enjoy family support.

**FIGURE 2. Retirement income system design**



*Source: Authors' compilation*

The UEPS and the Public Sector ension are both mandatory income replacement schemes. Given the current reform of the Public Sector Pension, we will focus on the UEPS. Two important points need to be made, First, the benefit, while calibrated as a proportion of final salary, is thereafter not indexed. Various discretionary adjustments are made to the pension in payment reflecting increases in cost of living and community standards. Second, while membership of the UEPS is mandatory for formal employees, these remain the minority of workers in China. The self-employed are not compelled to join, most migrants are not members, and those who are will likely not receive full benefits because of vesting rules.

The Enterprise Annuity Scheme, we treat as a voluntary saving mechanism under the third pillar of our schema (in China, it is regarded as a Second Pillar Scheme). Few workers are members; benefits are mostly paid as a lump sum at retirement, rather than an annuity. It is not a major focus in this paper.

On current settings, these plans will generate large deficits into the future, Already, the annual balance between contributions and benefits is negative for the UEPS. The DB component is negative for women, and roughly in balance for men, the difference arising both from the earlier retirement age of women and their greater life expectancy.[5] Thus far, the individual account is a minor component of retirement benefits for current retirees, but will become more important as the system matures. Over the next period, longer life spans and limitations to contributor growth are likely to drive ever larger shortfalls.

One longstanding policy response is to increase the overall contribution flow, sometimes by offering lower contribution rates to marginal groups such as new entrants, possibly migrants. Negotiations are often undertaken on an enterprise by enterprise basis to increase coverage of their employees. Compliance effort varies by jurisdiction: in general, poorer jurisdictions expend lees effort on ensuring compliance, relying instead on central transfers for benefit payment. Often, additional enrolments will lead to still higher future debt, the cost of solving an immediate financial shortfall.

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[5] Authors' calculations, available on request.

As well, the standard social pooling contribution rate of 20% is widely perceived as a disincentive to formal sector UEPS enrolment, and there have been periodic calls for some reduction. The national government has recently moved to marginally reduce this rate (Lu 2017).

The present value of the implicit pension debt (IPD) is difficult to estimate, because defined benefit promises are in fact not well defined beyond the initial payout year, and discount rates are hard to agree on. The current estimates of IPD are considerably inflated by the legacy debt of pre-1996 arrangements, when a non-contributory scheme operated. In terms of currently accruing liabilities, it is the individual account obligations that dominate.

There is not yet a consensus for the calculation of IPD costs. The MOHRSS, the MOF and the National Development Reform Committee (NDRC) have all estimated the IPD, with values between RMB 1.4 trillion and 6.3 trillion (based on 1995-2005 reports estimates), though these figures seem low even at the upper bound. Other estimates suggest that the IPD might be much higher. The Chinese Academy of Social Science (CASS) reported that the overall IPD totalled RMB 60.6 trillion in 2014, nearly 100% of GDP, and more than four times the current total fiscal revenue (Zhang 2015 p 10, Lu 2017).

The IPD estimates reported above do point to the need for long term pension reform, and this is acknowledged by policymakers. The NDC paradigm figures in this debate, as we indicate above. But thus far, the nature and timing of reform have not been agreed.
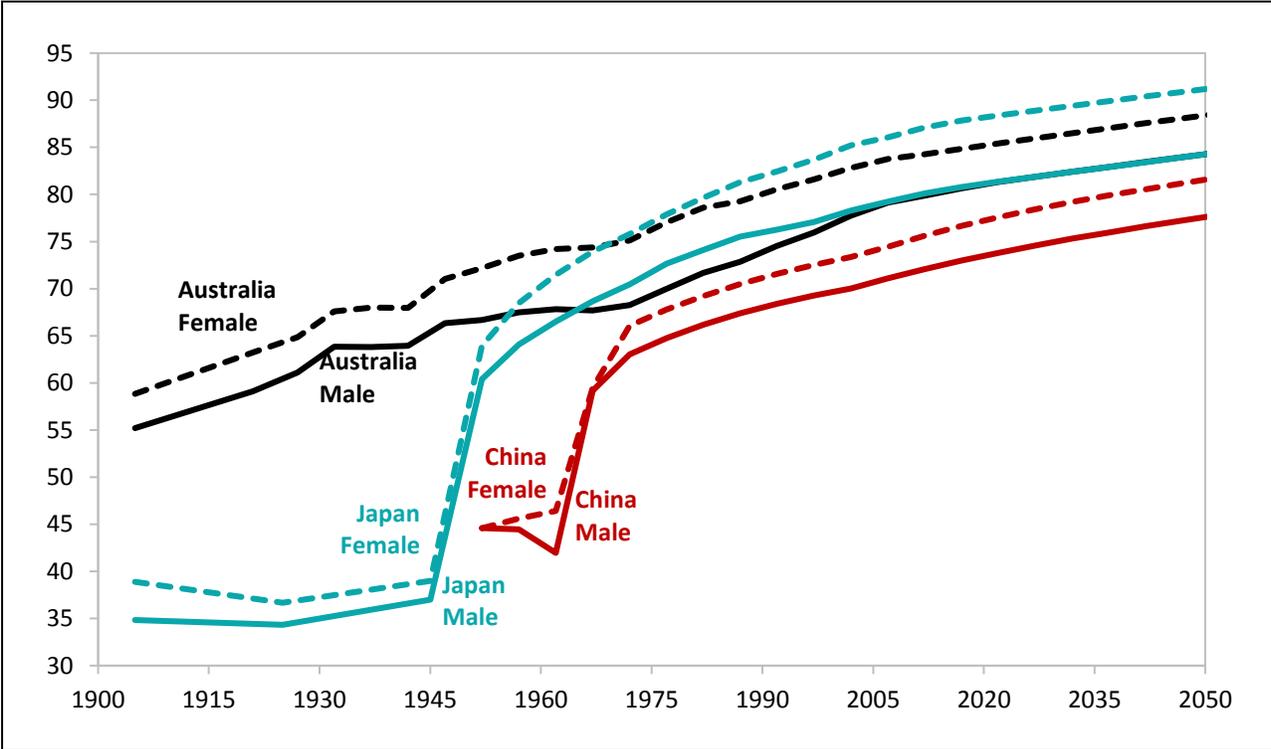
The overall structure of China's retirement policy may appear piecemeal. But it is important to appreciate that it operates in a country that is itself piecemeal. The urban-rural divide, the heterogeneity in living standards across provinces, the multiple levels of administrative jurisdiction, and the range of public financing authorities for these schemes, all interact to make integration challenging. As well, the different legal and background characteristics of the working (and retired) population – urban, rural, migrants – compound this issue. It is to these institutional and social structures that we now turn.

2. **Demographic and institutional considerations**

Demography. China is one of the world's most rapidly ageing economies, a phenomenon driven by both increasing life spans and declining fertility. Both these components are important for pension design, but here we focus principally on life expectancy, and its trends through time.

Figure 3 depicts changes in life expectancy over time, and compares these trends with those in two other countries with high life expectancy – Japan and Australia. Japan and China both experienced very rapid increases in life expectancy as they emerged from less developed status, followed by steady increases. China still falls significantly below these countries in life expectancy. This is probably because the forces behind declining mortality at mature age, which has driven most of the life expectancy increase in developed countries since the mid-1980s, have yet to manifest themselves in China's mortality statistics.[6] Mature age life expectancy still has some way to go in China, a point relevant to debate about pension policy, and especially access, or retirement, age.

**FIGURE 3. Life expectancy at birth (years), 1901-2051**



*Source: Human Mortality Database www.mortality.org; ABS Cat 3302.0.55.001; ABS Cat 3105.0.65.001; UN (2011) 'World Population Prospects: The 2010 Revision'; Jannetta & Preston (2010)*

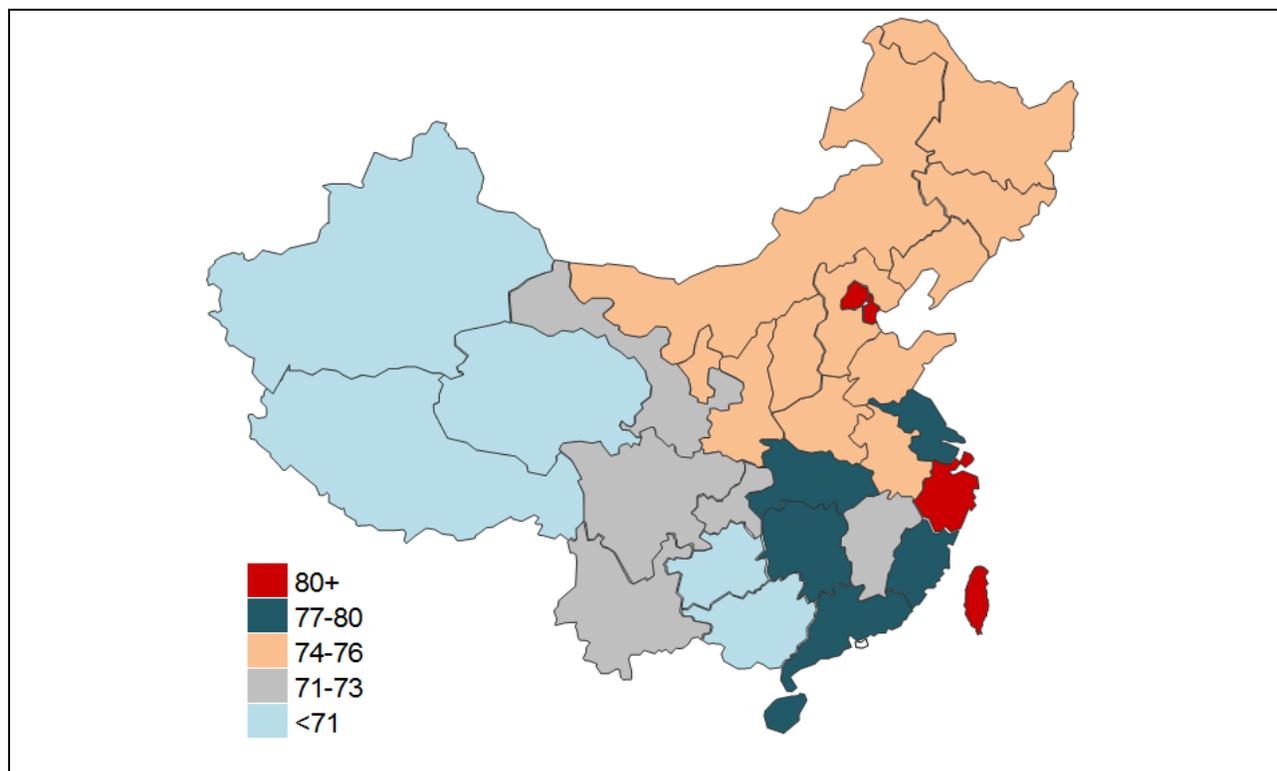However, Figure 3 masks several interacting trends germane to pension policy design. First, there is a surprisingly wide variation in life expectancy by province – more than 10 years – see Figure 4. This immediately calls into question the idea of a uniform pension plan – there is an

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[6] For example, the incidence of male adult smokers is about the same in China now as it was 40 years ago in Australia.

important sense in which China can be seen as a number of countries, at different stages of development, with associated differences in socio-economic characteristics.

However, official data from 2005 suggests that life expectancy at age 60 varies much less – from 18.4 to 20.2 years (MOHRSS 2008)[7]. We have independently undertaken our own calculations of provincial differences in life expectancy at 60, using 2010 census data. These also suggest much greater homogeneity – an overall range of less than three years. These estimates are preliminary, and refinements may reveal more differentiation, but for now, we might assume similar lifespans after 60 on average across provinces.

**FIGURE 4. Life expectancy at birth by province, 2013**



*Source: Zhou et al (2015)*

Further, when the UEPS is considered, it is predominantly urban, even city, life expectancies that matter. Table 2 reports urban (city) life expectancies at birth and at age 60 for three high income regions and three low income regions, along with associated estimates of GDP per capita.

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[7] Source: http://www.chinajob.gov.cn/SocialSecurity/content/2008-11/12/content_479917.htm

These are remarkably uniform. Interestingly, city life expectancy in low income jurisdictions slightly exceeds those in higher income jurisdictions. Our speculation is that city residents in low income jurisdictions, such as Tibet, are an elite, whereas in Shanghai, the city catchment is much broader. What matters for UEPS pension reform, however, is that life expectancies are not as heterogeneous geographically as provincial estimates of life expectancy might suggest.

**TABLE 2. Life expectancies in City Average in High and Low-income Provinces in 2010**

|  | High-income Regions | | | Low-income Regions | | |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Shanghai** | **Guangdong** | **Jiangsu** | **Guizhou** | **Guangxi** | **Tibet** |
| **GDP pc (RMB)** | 76,000 | 44,700 | 47,300 | 13,100 | 20,200 | 17,000 |
| **LE at birth** | 81.6 | 80.4 | 80.883 | 82.3 | 82.5 | 85.1 |
| **LE at 60** | 23.5 | 22.8 | 22.8 | 24.8 | 24.8 | 26.5 |

*Source: Authors' calculations based on provincial data of the 6th National Census in 2010 for life expectancy and GDP per capita data from the China Bureau of Statistics website.*

Finally, the rural-urban migration that has taken place over the last three decades, and continues currently, is the largest migration in human history. In 2015, about 250 million people were "floating" - their Hukou was different from their place of residency and work. Most of these are rural residents. A small proportion have joined the UEPS; the others have potential rights under the RURPS. This presents enormous challenges to pension fund governance. The extraordinary difference in entitlements between these undocumented workers and their documented counterparts has not been at all adequately addressed in China's pension policy reform.

Institutions.   Institutional arrangements in China are remarkably robust. If we average the World Bank Governance Index components, and exclude "Voice and Accountability", China places on average at nearly the half way mark world-wide, a remarkable achievement for a country at its present stage of development. These social structures, while robust, are also inflexible, at least those embodying the administration of pensions, and must be reckoned as institutional constraints on pension reform. Here, we attempt to provide a brief overview of the governance of retirement policy.

It is convenient to begin with political and administrative structure. At the immediate sub-national level, China is made up of 31 jurisdictions: 22 provinces, 4 cities, and 5 autonomous regions.[8] At lower levels of administration, there are more than 300 cities, and nearly 3000 towns and villages, or counties.[9]

Pension related administrative agencies are located in more than 3400 offices which by "Social Security Law" are the operating bodies for all contribution collection and distribution records. The fund collection channels are either through social security agencies or local tax offices and there is ongoing disagreement as to which channel should be used. For example, while currently 14 provinces collect social insurance contributions through the Tax Agency and the Ministry of Finance (MOF) would like to have that practice standardized, the Ministry of Human Resources and Social Security (MOHRSS) does not agree, for reasons of control (Lu 2017).

The "social pooling" that constitutes the heart of the DB component of the UEPS takes place within these sub-jurisdictions. Although most provinces claim to have pooling at the provincial level, they mostly have an adjustment fund system instead of the actual pooling at this level. Only a few provinces and cities (Shanghai, Beijing, Tianjin, Chongqing, Shaanxi and Qinghai) have achieved actual provincial pooling. Relatedly, agencies continue to move only slowly towards greater harmonization on data sharing. In mid-2015, the MOF connected to the MOHRSS *Jinbao* information system on social insurance for the first time, but the long-awaited Memorandum of Understanding between the MOF and the MOHRSS to exchange more complete data in real time on Social Insurance contributors and contributions is still being discussed. Given this background of practice and context, what follows in Section 3 should be thought of as illustrative.

## 3. Pension reform and the NDC

Our calculations of the operation of an NDC reform in China are embedded in some plausible assumptions about the evolution of the Chinese economy, changing life expectancy, and the evolution of the UEPS. The scenario we rely on is informed by considerations of global
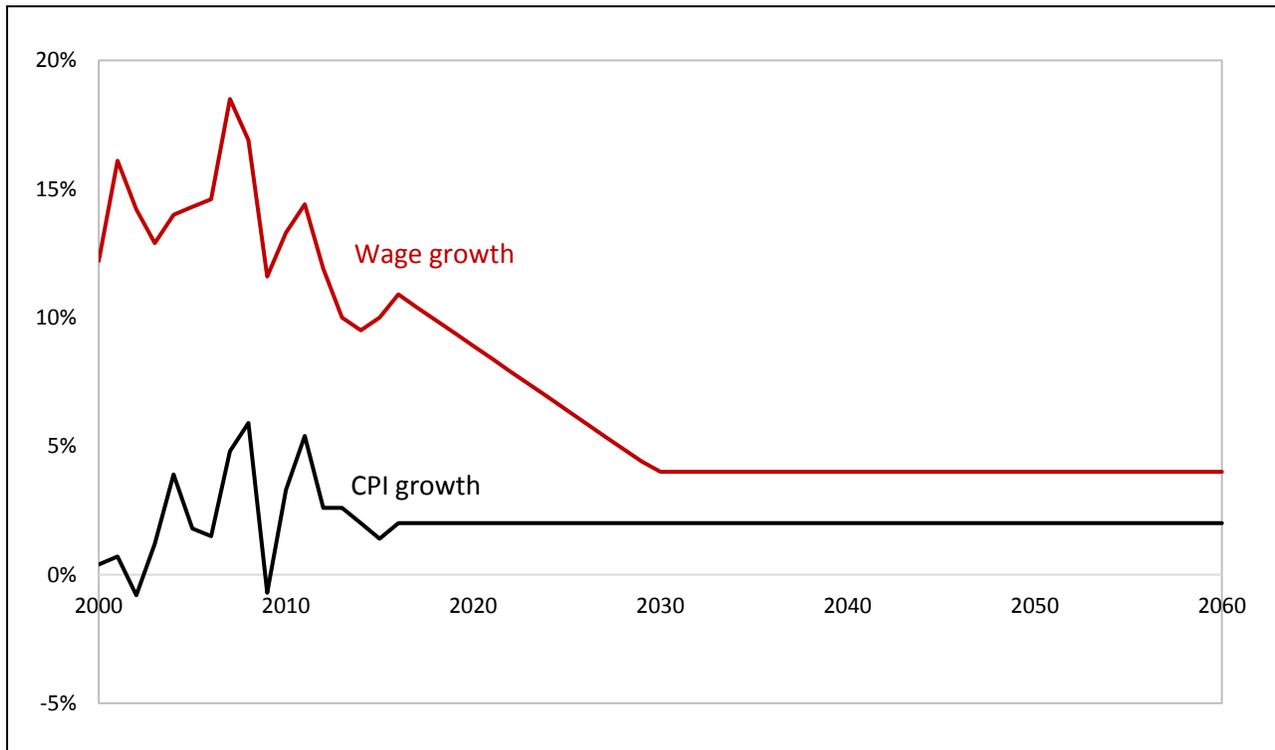
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[8] We exclude Hong Kong, Taiwan, and Macao.
[9] Data from China Statistic Year Book 2016

convergence, of likely patterns of mortality decline, and pays some regard to long term targets of Chinese policy.

Figure 5 plots our assumptions on convergence of wage and GDP growth. We assume linear convergence from 2017 to a steady state 4% nominal wage growth, and 2% price growth by 2030. We also assume that life expectancy will increase. Access age is adjusted linearly to 2060 according to the life expectancy estimates given in Table 3.

**FIGURE 5. Historic and projected wage and price growth**



*Source: Historical data from China Bureau of Statistics website.*

In practice, countries adopting an NDC paradigm choose some index of growth, such as GDP per capita or nominal wage growth, as a guide to the crediting rate. 10  For present purposes, we assume nominal wage growth as our crediting rate.

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[10] Notional account systems where the interest rate credited ex post is the growth rate of the average covered wage, or the growth rate of the covered wage bill, or the growth rate of GNP, do not exhibit automatic financial stability, except in hypothetical cases where the number of contributors and the contribution rate remain constant forever (Valdes-Prieto 2000 p 404). In our projection below, the number of contributors remain fairly constant from 2030 onward and our assumed wage growth has converged to

**TABLE 3. Unisex Life Expectancies**

|  | 2015 | 2060 |
|---|---|---|
| **LE at 60** | 20.0 | 24.5 |
| **LE at 65** | 16.0 | 20.5 |

*Source: Lu et al (2014)*

Individual benefits. This gives us sufficient parameters to generate projections of the individual experience of pension reform. We begin with a simple calculation of an NDC model in which the total contribution rate is unchanged from the current UEPS rate, the benefit is indexed to nominal wages, and life expectancy is as specified in Table 3. We assume an individual starts to contribute in 2030 (at which point our scenario converges to a steady state) at age 30, and earns average wages until age 65, when he retires. This yields a replacement rate of 45% at retirement. This compares with the target under the existing UEPS plan of a 59.5% replacement rate when retiring at 60 after 35 years of contribution today.

As indicated above, the high UEPS contribution rate has attracted the attention of reformers who argue that it discourages formalisation. Given the discretionary nature of enforcement, the impact of the contribution rate on formalisation is probably minor. However, for comparative purposes, we also calculate the replacement rate, under the same scenario assumptions, for a 20% contribution. This results in a 32% replacement rate.

System costs. To generate estimates of system sustainability and cost, we also need estimates of UEPS membership. The assumptions we make are given in Table 4. We set the urbanization rate according to the government target, and assume that the formal labour force participation rate converges to current OECD levels by 2035.

With these assumptions, it is possible to generate the evolution of UEPS membership through to 2060. Figure 6 depicts projections of both contributors and retirees, assuming that 80% of contributor accounts are active at any time (the current rate). This is actually quite a high contribution density- in practice, density will likely fall below 80%.

We are now able to calculate the cost of a reformed NDC system with characteristics as outlined above. Figure 7 depicts cash flow projections for a reformed system, where benefits gradually

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2% real as well. We can therefore use a stylised benefit calculation, in which access age is adjusted to maintain remaining life expectancy constant at 20.5 years.
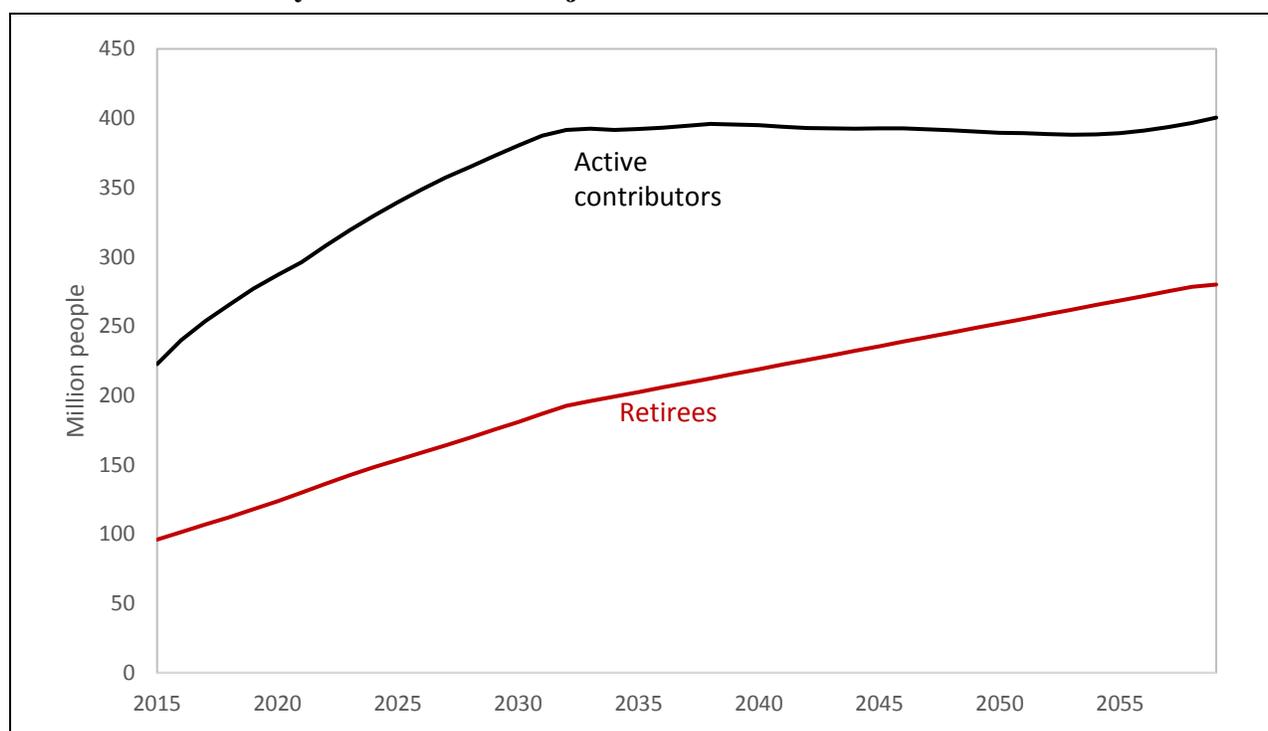
reduce from the current replacement rate to the NDC outcomes by 2060. Essentially, the net costs are the transition costs of moving from the promised UEPS benefits to those implied by an NDC paradigm – thereafter, on these assumptions, the system is self-sustaining.

**TABLE 4. Assumptions to generate projections of UEPS membership**

| Variable | Assumed Value |
|---|---|
| Urbanization Rate | From current 50% to 75% in 2050 |
| Pension system contributor | From current 40% to 65% of labour force population in 2035 and then stay constant |
| Retirement Age | Access age is adjusted to maintain remaining life expectancy constant at 20.5 years. |
| No. of pensioners | From the current 101 million to 280 million in 2050 (70% of 65 and above population) |
| Population Projection | As per Lu et al (2014), using fertility rate 1.55 scenario |

*Source: Authors' compilation*

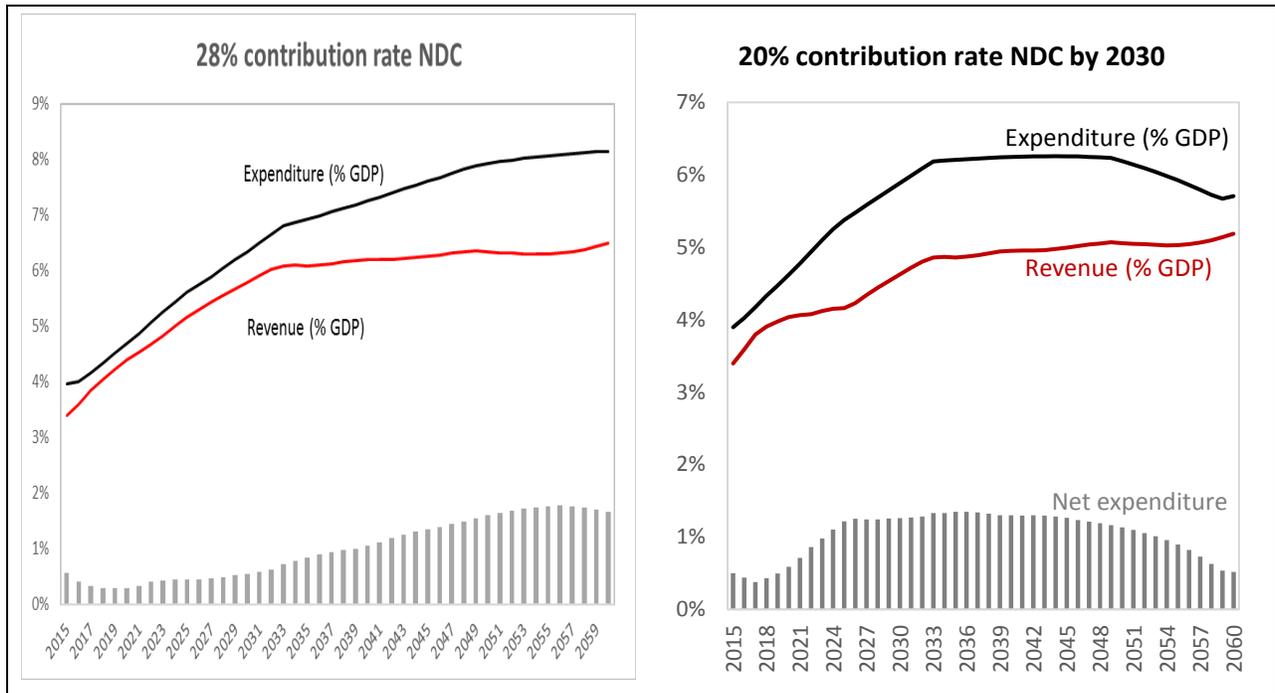**FIGURE 6. UEPS System Members Projection 2015-2060**



*Source: Authors' calculations*

Figure 7 projects the cash flow of two NDC scenarios: a continuing 28% contribution rate and a scenario where the contribution rate is reduced to 20% by 2030.

This projection exercise, while extremely simple, offers some policy implications. First, the notional defined contribution account helps to reduce the system liability in a flexible and manageable way and make it easier to adjust access retirement age in the future automatically. Secondly, even if the contribution rate is reduced to 20%, the financial shortfall peaks at 1.35% of GDP in 2035, and thereafter reduces to about 1% in 2060.

**FIGURE 7. Cash flow projection of an NDC pension system from 2015-2060 based on 28% and 20% contribution rate respectively**



*Source: Authors' calculations*

In practice, however, it is unlikely that 65% of the labour force will contribute an average of 35 years. Shorter contribution histories will naturally lower the benefit and replacement rate. In particular, eliminating vesting may lower contribution density, since there is no target to reach by remaining in the formal sector. This has been the experience in a number of emerging economies where defined contribution structures, whether funded or notional, have replaced more traditional PAYG social security systems. Retention of some kind of DB structure in the reform may serve to restrict this effect, and this may benefit China's growth in the medium term.

The Role of the Social Pension    A central feature of the NDC paradigm is that it is non-redistributive. This naturally places additional weight on the role of social pensions. Lu et al

(2014) analysed a social pension framework in which payments are pension tested – that is, vested members of the UEPS were not eligible to receive such a pension. Table 5 gives costs, as a percentage of GDP, for benefits set at alternative proportions of GDP per capita, and for alternative fertility rates. As China develops, the target benefit rate would probably lie at the upper end of these projections.

**TABLE 5. Social Pension Cost as % of GDP at age 65: Alternative Benefit Levels, Fertility Assumptions and Rates of Eligible Ratios of Elderly[11] by 2050**

| Eligible elderly ratio | Fertility | 6.60% | 10.00% | 15.00% |
|---|---|---|---|---|
| | F 0.9 | 1.55% | 2.34% | 3.52% |
| 76% of elderly | F 1.55 | 1.45% | 2.20% | 3.30% |
| | F 2.2 | 1.37% | 2.07% | 3.10% |
| | F 0.9 | 1.02% | 1.54% | 2.31% |
| 50% of elderly | F 1.55 | 0.96% | 1.45% | 2.17% |
| | F 2.2 | 0.90% | 1.36% | 2.04% |

*Note: F stands for fertility rate assumption. F 1.55 stands for the assumption that the fertility rate remains at 1.55 from now to 2050. The F 0.9 and F 2.2 scenarios have fertility converging linearly to these long term steady states by 2050, from the current fertility rate of 1.55.*

If the UEPS evolves as we project above, the eligible elderly will likely be a smaller fraction of the elderly population than the UEPS unreformed. By 2050, it is likely that only 30% of the elderly would be eligible for a social pension. This would reduce costs proportionately. On the other hand, UEPS members with low accumulations – and current practice suggests that there may be many such members – will requires Social Pension type support, perhaps along the lines of the recent Chilean reform, where a social pension supports those with (funded) pension accumulations which are insufficient to alleviate poverty. In practice, the evolution of such a social pension would probably make use of the RURPS structure.

### 4. Concluding Comments

This paper argues that pension reform in China is critical, and that there is a potential role for the NDC paradigm as China's pension reform evolves. However, there are major demographic,

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[11] Administration costs are not calculated here. It is difficult to estimate the cost of a social pension system as staff and information system are usually shared by various programs. According to Grosh et al (2008), targeting costs average about 4% of total program cost (p93).

institutional and political challenges to the implementation of reforms. The following summarises our more important findings:

- If the UEPS structure is retained in its current form, then policy adjustment will be more complex than would be the case with an NDC plan, in which access age is adjusted to mature age life expectancy automatically.
- A comprehensive NDC type reform would place far greater weight on social pension structures, because there is no associated minimum pension.
- If an NDC structure generates or is associated with higher mature age labour force participation, reliance on the social pension by full career contributors will decline.
- The NDC paradigm as specified here is more sustainable than the current UEPS. But this is of course at the cost of a substantially lower replacement rate. Given the political difficulty of reform in this arena, such a reform does not appear likely. Further, the individual account accumulation can currently be inherited when the member dies, which would not be the case under an NDC reform. This has been an issue in current debate around the adoption of an NDC paradigm.
- The vesting provision of the UEPS probably acts to retain workers in the formal sector for at least the minimum of 15 years. Recently, increasing vesting to 20 years appeared in pension reform discussion. Eliminating vesting runs the risk of lowering overall contribution density. It may therefore be desirable to retain a component of the reform plan as a DB structure with a vesting period.
- It would of course be possible to provide higher benefits with a higher crediting rate. To generate average benefits equivalent to the current UEPS would require a crediting rate of 5.5%, compared with the long term 4% implied by our scenario.
- Equally, it would be possible to reduce the contribution rate, thus reducing the pension-induced disincentive to work in the formal sector, and compensate for this by increasing the crediting rate. Essentially, this moves the cost of retirement from current to future generations. In the Chinese case, this may not be altogether bad – future generations are likely to enjoy a much higher standard of living than current generations. Inter-generational equity might be well served by moving some of these costs to the future.

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# Appendix A. Summary of Zheng et al (2015) for an NDC proposal and projection in China

| Name | Description | Benefit | Heritage of Individual account | NDC credit rate | Fund balance Implication | New retiree RR |
|---|---|---|---|---|---|---|
| Small NDC | 20% PAYG social pooling+8% NDC individual account | current scheme | Yes | 80% of average wage growth rate | | |
| Large NDC | 12% PAYG social pooling+16% NDC individual | 0.5*years of contribution*average on post basic wage (transition: 1.7*years of before reform contribution*salary indexation) | No | 80% of average wage growth rate | | |
| Full NDC | 28% Individual NDC | Actuarial fair payment, with a 5% RR of social pension | No | 100% of average wage growth rate | Fund balance to 69% of GDP by 2050 then decline to 0 by 2087 | 69% in 2050 and 62% in 2090 |
| | 24% Individual NDC | Actuarial fair payment, with a 5% RR of social pension | | | Fund balance to 50% of GDP by 2050 then decline to 0 by 2078 | 62% in 2050 and 56% in 2090 |