

Lessons from China on different approaches to pension coverage extension

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Abstract Achieving universal pension coverage is both an aspiration and a challenge for many developing economies. Traditional contributory schemes are less effective in extending pension coverage to workers who are not in the formal sectors of the economy. As an alternative, non-contributory schemes have gained popularity in recent years. China's pension reforms mirror this global trend. The introduction of a contribution-based pension scheme for urban employees (Employees' Pension) was followed by a scheme for rural and urban residents (Residents' Pension), which is partly government financed and partly contributory, with multiple options for premium payment. This study uses nationally representative survey data collected in 2016 to compare the inclusiveness of the two schemes. It finds that access to the Residents' Pension scheme is more equal than the Employees' Pension. Lower status workers in terms of education, employment, income and hukou-migration are more likely to participate in the Residents' Pension as opposed to the Employees' Pension, compared with higher status workers. The Chinese experience suggests that a workable solution for pension extension in low- and middle-income

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countries is to have a scheme that is flexible, affordable and responsive to the diverse needs of the population.

Keywords social security schemes, pension schemes, old-age benefit, coverage, China

Introduction

Achieving universal social security coverage is both an aspiration and a challenge for low- and middle-income countries. The United Nations Sustainable Development Goals reaffirm the international commitment to universal social protection, aiming to attain substantial coverage of the poor and the vulnerable by 2030. Much progress has yet to be made, given that currently less than a third of the world's population has access to comprehensive social security (ILO, 2017). The key challenge is to find effective ways to extend social security coverage to previously excluded individuals and groups (Hagemeyer and McKinnon, 2013; Holzmann, 2013; McKinnon et al., 2014).

Insofar as pension coverage is concerned, policy reforms since the 1990s have achieved limited success (van Ginneken, 2010; McKinnon et al., 2014). The World Bank and other international organizations have promoted the funded defined contribution (FDC) pension model in developing countries (World Bank, 1994). By design, the FDC model seeks to make the pension system more sustainable by shifting from defined benefits to defined contributions. In practice, despite “different incentive structures that have been tried”, various employee-employer contributory schemes have proved “ill-suited to remedy low pension coverage in developing countries” (Wang, Williamson and Cansoy, 2016, p. 86). Extending coverage to those working in the informal economy is a daunting challenge. The growth of informal employment in developing economies makes contributory pension coverage extension even more difficult (Alfers, Lund and Moussie, 2017).

As an alternative to the employee-employer contributory model, non-contributory social assistance schemes in the form of cash grants have gained popularity across Africa, Asia and Latin America (Aguila et al., 2016; Barrientos, 2013; Ferguson, 2015). Not premised on the attainment of formal employment, the non-contributory schemes are regarded as an inclusive and preferred approach to achieve universal social security coverage. Indeed, the 2012 International Labour Conference of the International Labour Organization adopted the Recommendation concerning National Floors of Social Protection,

2012 (No. 202), which seeks in the first instance to extend coverage to informal workers mainly through cash transfers and affordable basic health care (Alfers, Lund and Moussie, 2017; Deacon, 2013). Recommendation No. 202 is endorsed by the United Nations agencies and feeds into the 2030 Sustainable Development Goals (SDG) agenda.

The search for alternative models opens up space for research on the distributive effect of different pension schemes. Of particular interest is whether non-contributory schemes have substantially lowered the barriers to access and therefore reduced inequality in pension participation. For instance, Geri, de Santis and Moscoso (2019) show that Argentina's Pension Inclusion Plan is indeed pro-poor, while the traditional contributory scheme continues to privilege the better educated. It is also important to examine how the introduction of non-contributory schemes and related policy changes affect income distribution and welfare provision. In this vein, Alfers, Lund and Moussie (2017) raise the concern that the shift to non-contributory schemes financed by taxation may crowd out social spending for the poor and the vulnerable, thereby offsetting the redistributive impact brought by extended coverage.

This article focuses on pension extension, particularly the pattern of access. We seek to make two contributions to the literature. First, we argue that between the classic dichotomy of employee-employer contributory pension schemes and non-contributory social pension/assistance schemes there are hybrid forms that should not be ignored, theoretically or empirically. These hybrid forms are more flexible in terms of financing and eligibility than the often rigid and less affordable employee-employer contributory scheme. However, they are not typical cash-grant social assistance programmes financed by tax. Instead, they have both contributory and non-contributory components. The institutional features of these alternative schemes in general and their coverage extension effect in particular deserve greater academic attention. We use China's pension programme for rural and urban residents to make a case that hybrid contributory schemes that are financed only in part by contributions, if flexible and affordable, have a good chance of success in terms of pension coverage extension and in offering more equitable access.

Second, we analyse individual choices vis-à-vis different pension schemes in circumstances shaped by institutions and socioeconomic inequalities. The social security literature has come to stress population heterogeneity and recognize the need for social policies that respect and respond to individual differences (Hujo, Behrendt and McKinnon, 2017). In this light, the effectiveness of a particular pension scheme depends on how individuals with diverse needs, resources and capabilities view it in relation to alternative schemes. However, empirical research lags behind in this regard. A normal practice in past studies is to compare the "typical" or "average" characteristics of different groups to draw conclusions

about which pension scheme is pro-poor. A more sophisticated approach is to assess the gender-, income- or education-based inequality in pension participation separately for each scheme, and then determine which one is more equitable. Yet, even this latter approach is not without shortcomings. It still relies on a flawed methodology that assesses inequality within one scheme in isolation from that of others. We thus move a step further, using multinomial regression analysis to model how individuals with varying demographic and socioeconomic characteristics join one scheme instead of another (or opt out altogether). This analytical strategy simultaneously considers different options and therefore gives a more rigorous assessment regarding which scheme individuals prefer according to their personal characteristics.

Access barriers to contributory pension coverage

We begin with a literature review of various barriers found in low- and middle-income countries that prevent substantial pension coverage extension through employee-employer contributory schemes. Three broad perspectives have emerged, which focus on institutional exclusion, market/employer exclusion, and employees' self-selection respectively. These perspectives differ in their analytical locus, but much less so in identifying the characteristics of groups/individuals with lower levels of pension participation.

The institutional exclusion perspective highlights the effect of laws, regulations, policies, and administrative practices that favour the privileged and/or exclude the disadvantaged. In many cases, the social protection system is designed in a discriminatory way, "wherein labour legislation and labour protection built upon a contributory or corporate base are exclusive" (Sojo, 2015, p. 70). Civil servants usually are the most privileged in terms of pension coverage and benefits (Kpessa, 2011). Formal workers are another group with high pension coverage. In contrast, the pension systems designed for formal sectors are ill fitted for workers in informal sectors (Ghai, 2015). Moreover, social security administration in low- and middle-income countries typically lacks the ability to ensure regulatory compliance and achieve administrative and operational excellence (Enoff and McKinnon, 2011). Consequently, the phenomenon of dualism – a small minority of insiders versus a majority of outsiders – has been widely observed in developing countries.

The market exclusion perspective focuses more on the behaviour of employers/firms. Research in this regard suggests that the problem of low pension participation in developing countries is not necessarily due to the lack of regulation or laws stipulating mandatory social insurance, but rather a result of calculative strategies adopted by employers/firms. Unlike in countries with well-established rule of law, where regulatory enforcement is taken for granted

(Gelepithis, 2018), “mandatory” social insurance in developing countries is not necessarily “mandatory” in practice (Sojo, 2015). Previous studies show diverse ways in which firms respond to “mandatory” social insurance. Nyland, Thomson and Zhu (2011) find that some Chinese firms defend their failure to comply by claiming that the policy is vague and complex. Some blame the lack of a level playing field, fearing that they risk losing competitiveness to non-compliant firms if they choose to comply. In particular, firms commonly use social insurance as a tool to recruit and retain highly sought after employees in the labour market. Moreover, Nielsen et al. (2005) find that to reduce social insurance costs and bypass labour regulations, many labour-intensive firms hire workers through employment agencies rather than through direct recruitment.

In comparison, the self-selection perspective focuses on employees rather than institutions or employers. This line of research stresses that individuals are stratified in terms of their resources and capabilities, and have changing needs over the life course. Consequently, different employees respond to pension participation in diverse ways. Based on fieldwork in Africa, Bester et al. (2008) report that individuals face competing priorities. Education, housing and childbearing often take precedence over pensions, especially when people are young. Expected life expectancy is another factor, as people with shorter life expectancy are less keen to save for retirement. Affordability matters as well, because the mandatory saving of a fixed proportion of income is a greater burden for low-income families than for those that are better off. Trust in the pension programme is another important factor. Individuals with a low level of trust are less likely to join the pension programme (van Ginneken, 2010). Individuals also take into account the degree of ease with which pension enrollees pay contributions and receive benefits (Enoff and McKinnon, 2011).

For our research purpose, we view these perspectives as complementary rather than mutually exclusive. Despite differences in the analytical locus, the three perspectives share much in common in identifying vulnerable individuals. Generally speaking, the groups of people with lower pension coverage are typically those of lower socioeconomic status, who are more likely to work in the informal sectors, have lower levels of education, and earn less income. In China, *hukou*¹ status matters as an additional factor. Rural-to-urban migrant workers in particular are singled out as a disadvantaged group. Below we briefly discuss four main markers of socioeconomic status.

1. Hukou status determines whether a person is a registered resident of a rural or an urban area in China, which in turn determines access to certain social/public services, including social security programmes.

Education. From the institutional exclusion perspective, education is closely associated with the insider-outsider dualism in pension coverage (Sojo, 2015). The less educated are more likely to access informal jobs that have weaker labour protection, leading to their low participation in contributory social security schemes. From the market/employer perspective, “retaining skilled workers has long been considered an important motive for employer provision of non-wage benefits” (Gao and Rickne, 2017, p. 761). Labour-intensive enterprises often use a dual strategy to reward highly educated workers with social insurance benefits while capping total labour costs by excluding the rest of their workers from contributory schemes (Nielsen et al., 2005; Nyland, Thomson and Zhu, 2011). Empirical studies using different survey data in China reach a similar conclusion. The rate of participation in contributory pensions is lower for the less educated, either among migrant workers or more broadly among urban employees including migrant workers (Cheng, Nielsen and Smyth, 2014; Gao, Yang and Li, 2012; Jiang, Qian and Wen, 2018; Qin, Zhuang and Liu, 2015; Xu, Guan and Yao, 2011).

Employment status. The three cited perspectives agree on the importance of employment status for access to pension coverage. According to the institutional exclusion perspective, the contributory scheme often excludes informal workers. The association between employment status – formal versus informal – and pension participation has been widely observed (van Ginneken, 2010; Holzmann, 2013; McKinnon et al., 2014). The market/employer exclusion perspective notes that many private enterprises extend social insurance only to “key” workers with much needed skills (Nyland, Thomson and Zhu, 2011), while rank-and-file workers are hired through labour dispatch agencies to avoid signing labour contracts and paying social insurance contributions (Nielsen et al., 2005). Such employment strategies inevitably lead to unequal access to social insurance even between ostensibly formal employees. The self-selection perspective sheds further light on why competing needs, cost-benefit calculations, as well as distrust of social insurance programmes often lead petty entrepreneurs or self-employed individuals to opt out of contributory schemes (Bester et al. 2008). Empirical research has shown that Chinese workers with lower pension coverage are those in the non-state sector (Cheng, Nielsen and Smyth, 2014; Qin, Zhuang and Liu, 2015), in the informal sector (Jiang, Qian and Wen, 2018), and individual business owners (Gao, Yang and Li, 2012).

Income. Both the institutional exclusion perspective and the market/employer exclusion perspective do not take income as a prerequisite or direct determinant

of access to pension coverage. In comparison, the self-selection perspective suggests that low-income workers may opt out of contributory pension coverage because they have more urgent needs than saving for retirement or they find pension payments unaffordable (Bester et al., 2008). Evidence for the income effect is mixed. After controlling for education, employment status and other factors, some studies find that lower-income employees have lower pension coverage (Gao, Yang and Li, 2012; Nielsen et al., 2005), while some do not (Jiang, Qian and Wen, 2018). Research using consumption instead of income to measure socioeconomic inequality shows a positive association between household expenditure and pension participation among Chinese urban workers (Qin, Zhuang and Liu, 2015).

Hukou/migration. In China, the hukou system, which registers people as either rural or urban residents and limits certain locally provided social/public services to locally registered residents, has long been an exclusionary institution (Chan and Zhang, 1999; Wang, 2005). Unsurprisingly, migrant workers (typically, rural-urban migrant workers) do not enjoy the same social rights as local hukou holders (Ngok, 2016; Jiang, Qian and Wen, 2018). The low levels of pension coverage for rural-urban migrant workers is often explained by reference to hukou-based institutional exclusion. Likewise, the market/employer exclusion perspective provides a similar hukou-based explanation. Research, following the self-selection perspective, suggests that lack of trust in the pension programme discourages migrant workers from joining. Zhan (2011, p. 256) reports that migrant workers were “inclined to save for their own retirement and exhibited little desire to put their money in the hands of various levels of government”. Echoing this finding, Huang and Guo (2017, p. 81) quote a migrant worker saying, “Because the policy is always changing and our earnings are quite low, we are very concerned that we will be cheated. To be frank, savings in the bank are more secure; who knows how our contribution has been spent!”. Studies based on quantitative data have shown a negative effect of rural hukou on migrant workers’ pension coverage (Gao, Yang and Li, 2012; Gao and Rickne, 2017; Park, Wu and Du, 2012; Jiang, Qian and Wen, 2018).

Pension coverage extension through the Urban and Rural Residents’ Pension Scheme

China’s pension system continues to evolve. Currently it has three schemes targeting different population groups. The Urban Employees’ Pension Scheme is designed to cover urban enterprise employees, the Urban and Rural Residents’

Pension Scheme is for farmers and urban non-working residents,² and the third scheme is for civil servants and those working in public service units, the Civil Service and Public Service Unit scheme (Liu and Sun, 2016; Queisser, Reilly and Hu, 2016).³

The three schemes are structurally similar in that each has a social pooling account and an individual account. However, the Employees' Pension and the Residents' Pension differ markedly in financing and contribution rates. The current Civil Service and Public Service Unit scheme, set up in 2015, is modelled on the Employees' Pension. Nonetheless, empirical research shows a clearly stratified pension system, which privileges the Civil Service and Public Service Unit scheme over the Employees' Pension in terms of benefit levels, while the Residents' Pension lags far behind (Zhu and Walker, 2018). As the research interest of this article lies primarily with disadvantaged workers, in the following sections we will focus on the Employees' Pension and the Residents' Pension.

The Employees' Pension in its current form was introduced in 1997 and is an employee-employer contributory scheme (World Bank, 1997). Similar to other schemes in other developing countries, this programme proves ineffective in covering informal workers, particularly migrant workers. The National Bureau of Statistics (NBS) of China⁴ began issuing annual reports on “peasant workers” – the Chinese term for rural-to-urban migrant workers – in 2008, but ceased releasing pension coverage and health insurance enrolment data after 2014, probably due to the insignificance of such programmes for migrant workers. Based on the NBS annual reports, Table 1 clearly shows that the overwhelming majority of migrant workers (over 100 million in absolute terms, or over 80 per cent) were not covered by the Employees' Pension or Health Insurance from 2008 to 2014.

A residents' scheme was established in 2009 for rural residents, followed in 2012 by a similar scheme for urban non-working residents. The two schemes were merged in 2014 to create the unified Residents' Pension. The Residents' Pension has expanded China's pension coverage in a remarkable manner (Chen and

2. For the sake of brevity, hereafter in this article, the Urban and Rural Residents' Pension Scheme is referred to as the Residents' Pension; the Urban Employees' Pension Scheme is referred to as the Employees' Pension.

3. Previously, civil servants and employees in public service units were covered by a non-contributory, defined-benefit pension scheme. The reform in 2015 changed the scheme to one that resembles the Employees' Pension (Dong and Wang, 2016; Liu and Sun, 2016; Queisser, Reilly and Hu, 2016).

4. See the National Bureau of Statistics (NBS) website for data. Social security coverage data for “peasant workers” from 2008 to 2013 are available here (in Chinese); and data for 2014 are available here (in Chinese).

Table 1. *Rate of enrolment in Employees' Pension and Health Insurance for rural-to-urban migrant workers*

	Number of migrant workers (million)	Employees' Pension (%)	Health Insurance (%)
2008	140	9.8	13.1
2009	145	7.6	12.2
2010	153	9.5	14.3
2011	159	13.9	16.7
2012	163	14.3	16.9
2013	166	15.7	17.6
2014	168	16.4	18.2

Source: National Bureau of Statistics (NBS) website for "Survey report on peasant workers" data. Social security coverage data for "peasant workers" from 2008 to 2013 are available here (in Chinese); and data for 2014 are available here (in Chinese).

Turner, 2015; Ghai, 2015; Liu and Sun, 2016; Queisser, Reilly and Hu, 2016; Zhang and Wu, 2016). By the end of 2017, the Residents' Pension had extended coverage to 513 million enrollees; coverage under the Employees' Pension has also grown, with coverage extended to more than 403 million (China Statistical Press, 2018). By any measure, China's extension of pension coverage in the past decade has been extraordinary. Some scholars claim that "China has achieved a degree of universalism ... unprecedented in the non-Western world" (Liu and Sun, 2016, p. 15).

For our research purpose, it is noteworthy that the Residents' Pension is not exclusively for farmers and the urban non-working population. The Residents' Pension is also open to urban workers including migrant workers, provided they are not covered by the Employees' Pension. The pension policy also allows enrollees to transfer from the Employees' Pension to the Residents' Pension. However, there is a caveat: migrant workers cannot join the Residents' Pension in the hosting cities; rather, they have to enrol in the scheme at their place of household registration. Put another way, urban workers with a local hukou have an option of joining either the Employees' Pension or the Residents' Pension, both locally administered, while rural-to-urban migrant workers have the option of joining the Employees' Pension administered by the hosting city or the Residents' Pension in their home county.

If pension coverage extension is indeed a priority goal, the question is whether those not covered by the Employees' Pension would find the Residents' Pension worthwhile to join. To date, this question has not been sufficiently addressed. Recent research relying on descriptive analysis and aggregate data cannot

separate those who have an option to join from those who do not (Ghai, 2015; Queisser, Reilly and Hu, 2016). The latter includes farmers and urban non-working residents who are not eligible for the Employees' Pension. Some studies use data collected prior to 2009, making it impossible to examine whether the Residents' Pension is better at accommodating disadvantaged workers than the Employees' Pension (Cheng, Nielsen and Smyth, 2014; Gao, Yang and Li, 2012; Gao and Rickne, 2017; Xu, Guan and Yao 2011). Studies that are more recent contrast those with and those without a pension, without making a finer distinction between the Employees' Pension and the Residents' Pension (Jiang, Qian and Wen, 2018). Moreover, many studies limit their analysis to migrant workers instead of a larger and more diverse pool of urban workers (Cheng, Nielsen and Smyth, 2014; Gao et al., 2012; Huang and Guo, 2017; Xu, Guan and Yao, 2011).

The existing literature has offered detailed descriptions of the structure, financing and pay out of the two schemes (Chen and Turner, 2015; Liu and Sun, 2016; Queisser, Reilly and Hu, 2016). Structurally, the Employees' Pension consists of two mandatory components: the social pooling account and the individual account. The social pooling account is funded by the employer. The rate of contribution has been lowered from 20 per cent of the payroll to 16 per cent in recent years. The individual account is funded by the employee at the rate of 8 per cent of his or her payroll. The employee-employer contribution period is subject to a minimum of 15 years. Upon reaching the retirement age (normally, 60 years for men, 55 for female white-collar workers, and 50 for female blue-collar workers), pensioners receive a monthly pension based on a formula that considers the average local wage in the previous year, the average individual monthly wage used to calculate the contribution, and the number of years of contribution (Queisser, Reilly and Hu, 2016).

The Residents' Pension is voluntary for those aged 16 or older. Structurally it also consists of two accounts: the basic pension account and the individual account. However, it differs substantially from the Employees' Pension in terms of financing. The basic pension account is fully financed by the government, either entirely by the central government (for central and western provinces) or jointly by the central government and local governments (for eastern provinces). In comparison, the individual account is financed from a variety of sources, including local government subsidies, matching contributions from village collectives and/or village enterprises, and individual contributions. Individuals can choose to pay between CYN 100 (Chinese yuan) and CNY 2,000 annually, with the optional rates differentiated by increments of CNY 100, subject to local variations in the minimum and maximum contribution (Queisser, Reilly and Hu, 2016). The pensionable age is 60 for both men and women, subject to a minimum of 15 years of contribution. The monthly pension includes both the

basic pension (a flat-rate benefit funded from the social pooling account) and an additional pension (calculated by dividing the balance of the individual account at the time of retirement by 139).

Clearly, the two schemes are different in institutional design. The Employees' Pension is de jure mandatory, financed by contributions from employers and employees at fixed rates. In contrast, the Residents' Pension is voluntary, comprising a social pension component and a contributory one. The contribution rate is not fixed. Individuals can choose an affordable amount from a list of options.

Given these differences, the question is whether the new features of the Residents' Pension can attract workers not covered by the Employees' Pension. Specifically, we ask how urban workers might choose between the two schemes and whether socioeconomic status affects their choice behaviour.

We derive two sets of testable hypotheses. The first set concerns the effect of variables measuring socioeconomic status – education, employment status, income, and hukou/migration status – on the likelihood of joining the Residents' Pension as opposed to the Employees' Pension. Our earlier literature review suggests that institutional exclusion, market/employer exclusion and self-selection function to exclude or discourage from joining the Employees' Pension those with lower levels of education, who work in the informal sectors, earn lower levels of income, and hold a rural hukou. We argue that the three cited mechanisms work markedly differently as regards the Residents' Pension.

On the one hand, the first two – institutional exclusion and market/employer exclusion – are entirely absent. Institutionally, the Residents' Pension is voluntary and inclusive, open to any working and non-working adults under conditions unrelated to education, employment status, income, or hukou/migration status. Furthermore, it does not involve employers. Unlike the Employees' Pension, exclusionary institutions and/or employers cannot act as barriers for access to the Residents' Pension. On the other hand, the self-selection mechanism is highly likely to work in a different way for the Residents' Pension than for the Employees' Pension. Given that workers of lower socioeconomic status have diverse needs and prioritize affordability, the Employees' Pension is obviously ill suited due to the feature of fixed high contribution rates. By comparison, the Residents' Pension would better meet these workers' need for a flexible and affordable pension plan. Taken together, we hypothesize that: *the effect of education, employment status, income, and hukou/migration status is considerably smaller on participation in the Residents' Pension than for the Employees' Pension.*

The second set of hypotheses concerns the interaction effect of hukou/migration status and other variables such as education, employment status and income on the likelihood of joining the Residents' Pension versus the Employees' Pension. Essentially, it is about whether the pattern of access posited in the first set of

hypotheses varies between rural-to-urban migrant workers and workers with urban hukou (hereafter, urban hukou workers). Given that institutional exclusion and market/employer exclusion are often based on workers' hukou status, the Employees' Pension should disadvantage migrant workers with lower socioeconomic status more than urban hukou workers with comparable characteristics. By the same token, if the Residents' Pension effectively removes these exclusionary factors, it should benefit the disadvantaged migrant workers more than comparable urban hukou workers. Hence, we hypothesize that: *the effect of education, employment status and income on participation in the Residents' Pension versus the Employees' Pension varies between rural migrant workers and urban hukou workers. More specifically: while the Residents' Pension is more accommodating for lower status workers than the Employees' Pension, its equalization effect is even larger for lower status migrant workers compared with lower status urban hukou workers.*

Data, variables and descriptive analysis

Data

We use the 2016 wave of the China Labor-force Dynamics Survey (CLDS), collected by the Center for Social Science Survey at Sun Yat-sen University in Guangzhou, China. CLDS is a nationally representative survey, covering 29 provinces in mainland China except Tibet and Hainan. It followed the multistage cluster, stratified, PPS (probability proportional to size) sampling method. Family members aged 15–64 in the selected households were all interviewed. Those aged 65 or older were also interviewed if they had been working at the time of the survey. One of the most widely used data sets regarding China's labour force, CLDS has detailed information on respondents' demographics, migration history, employment, and social insurance participation, making it particularly useful for this research.

The 2016 wave of CLDS has a sample size of 21,086. We exclude those who were in schools in 2016 and those younger than age 16, who were not eligible for the Residents' Pension. For our research purpose, we focus on interviewees who had active employment in cities at the time of the survey, because they are the only ones who were eligible for either the Employees' Pension or Residents' Pension. This means that we have to exclude urban non-working residents as well as non-migrant rural hukou holders. Members of these groups are not eligible for the Employees' Pension. This leaves us with 4,189 cases, comprised of 3,214 urban hukou holders and 975 rural migrant workers.

Variables and measurement

Our dependent variable is *pension participation*. The survey asked respondents a set of questions regarding whether they were covered by a pension provided by any of the following:⁵

- Work unit
- Urban Employees' Pension Scheme
- Urban Residents' Pension Scheme
- Rural Residents' Pension Scheme
- Urban–Rural Residents' Pension Scheme
- Commercial pension products

We created a multinomial variable for pension participation, coded 1 if the respondent was covered by pension provided by the work unit or the Urban Employees' Pension Scheme coded 2 if covered by the Urban Residents' Pension Scheme, the Rural Residents' Pension Scheme, or the Urban-Rural Residents' Pension Scheme and coded 0 for the remaining cases. Clearly, category 1 indicates participation in the Employees' Pension, category 2 the Residents' Pension, and the rest are cases not covered by either of these two.

Independent variables are *education*, *employment status*, *income*, and *hukou-migration*. *Education* is measured by the respondent's self-reported highest level of education, including primary education or lower (the reference group), junior secondary, senior secondary, and college. *Employment status* is a measure of the respondent's current employment based on a number of questions asked in the survey. We made the first cut based on the question that asked the respondent to self-identify his or her current employment as an employee, an employer (hiring one or more workers), as self-employed (without hiring any worker), or as a farmer. Since our analysis excludes farmers, our first cut divided respondents into one of the three categories: employee, employer, and self-employed (the reference group). We then made the second cut by dividing employees into formal employees and informal employees. One question asked those working in the public sector (such as for the Communist Party of China and government agencies, public service units, and state-owned or collective-owned enterprises) whether they were employed in a budgeted post (*bianzhi* in Chinese). We classified those with a budgeted post as formal employees. Other employees in the public sector were coded as informal employees.

5. The Rural Residents' Pension Scheme (established in 2009) and the Urban Residents' Pension Scheme (established in 2012) were merged in 2014 to create the Urban–Rural Residents' Pension Scheme. Based on the classification given by the China Labor-force Dynamics Survey (CLDS), the pension provided by the work unit refers to the pension paid out of government budget for employees in government agencies and public service units. Starting from 2015, it was reformed into a contributory scheme that resembles the Urban Employees' Pension Scheme.

For employees in the private sector, we distinguished between formal and informal employees based on the question that asked respondents to report whether they had complete, partial or no autonomy in deciding the scope, pace and intensity/amount of work. We coded those with complete and partial autonomy as formal employees, and the rest as informal employees.

Income is measured based on respondents' self-reported income from all sources in 2015. We ranked respondents and divided them into one of four groups: high income (the highest quartile); upper middle income (the second quartile); lower middle income (the third quartile); and low income (the bottom quartile and the reference group). *Hukou-migration* is a dummy, coded 1 if the respondent is a rural migrant worker. The reference group comprises urban hukou workers.

Control variables include *gender*, *marriage*, *age*, and *province* dummies. Regarding the gender effect on pension participation, previous studies have produced mixed results. Some find a female advantage (Jiang, Qian and Wen, 2018; Qin, Zhuang and Liu, 2015; Xu, Guan and Yao, 2011), while some find no gender effect (Gao and Rickne, 2017; Nielsen et al., 2005). Few studies have examined the effect of marital status on pension participation, with one reporting no effect (Xu, Guan and Yao, 2011). Age is measured either as a continuous variable or as a set of cohort dummies in the literature. Some studies show a positive age effect (Gao and Rickne, 2017; Jiang, Qian and Wen, 2018; Qin, Zhuang and Liu, 2015); some find no effect (Nielsen et al., 2005; Xu, Guan and Yao, 2011). Age is measured as a set of dummies in our analysis, including cohort 1 (born 1950–1959), cohort 2 (born 1960–1969), cohort 3 (born 1970–1979), cohort 4 (born 1980–1989), and cohort 5 (born in 1990 or after). The youngest cohort is the reference group. We measure age in this way to capture the intergenerational difference.⁶

Descriptive analysis

Table 2 presents the descriptive analysis of dependent, independent and control variables. While all respondents in our analysis are eligible for the Employees' Pension, Table 1 shows that only 53 per cent have actually joined. In line with the literature, this finding suggests that the employee-employer contributory scheme is indeed much less inclusive than expected. Notably, 30 per cent of respondents have participated in the Residents' Pension, suggesting that it plays a sizable role in pension coverage extension among working adults.

6. In China, the term “post-80” has been coined for those born in the 1980s, who are believed to have distinctive outlooks from older generations. Likewise, the term “post-90” has appeared to express the identity of those born in the 1990s as distinct from that of the “post-80” generation. Similarly, China's National Bureau of Statistics uses the term “new generation peasant workers” to denote rural migrant workers born in 1980 and after.

Table 2. Descriptive analysis of main variables

	Mean	S.D.	Min	Max
<i>Pension participation</i>				
Employees' pension	0.53	0.50	0	1
Residents' pension	0.30	0.46	0	1
Male	0.54	0.50	0	1
Married	0.85	0.36	0	1
<i>Age cohort</i>				
cohort 1 (born between 1950 and 1959)	0.07	0.25	0	1
cohort 2 (born between 1960 and 1969)	0.25	0.43	0	1
cohort 3 (born between 1970 and 1979)	0.31	0.46	0	1
cohort 4 (born between 1980 and 1989)	0.27	0.44	0	1
cohort 5 (born in 1990 and after)	0.11	0.32	0	1
<i>Education</i>				
primary and below	0.09	0.29	0	1
junior secondary	0.27	0.44	0	1
senior secondary	0.26	0.44	0	1
college	0.38	0.48	0	1
<i>Employment status</i>				
formal employee	0.53	0.46	0	1
informal employee	0.28	0.50	0	1
employer	0.04	0.19	0	1
self-employed	0.15	0.41	0	1
<i>Income Quartile</i>				
high income	0.23	0.42	0	1
upper middle income	0.29	0.45	0	1
lower middle income	0.25	0.43	0	1
low income	0.23	0.42	0	1
<i>Hukou-migration</i>				
rural migrant	0.23	0.42	0	1
urban hukou holder	0.76	0.42	0	1

Note: N=4,189.

Source: Data derived from the 2016 wave of China Labor-force Dynamics Survey (CLDS), collected by the Center for Social Science Survey at Sun Yat-sen University in Guangzhou, China. Please refer to css.sysu.edu.cn for more information about the CLDS data.

Table 3. *Pension participation (%) by hukou-migration type*

	Employees' pension	Residents' pension
Rural migrant (<i>n</i> =975)	21.5	31.4
Urban hukou holder (<i>n</i> =3,214)	62.0	29.0

Source: Data derived from the 2016 wave of China Labor-force Dynamics Survey (CLDS), collected by the Center for Social Science Survey at Sun Yat-sen University in Guangzhou, China. Please refer to <http://css.sysu.edu.cn> for more information about the CLDS data.

Table 2 also shows that the respondents are diverse or stratified in terms of education, employment, income, and hukou status. It is worth noting that formal employees make up slightly over half of the urban workforce in our sample. Informal employees account for 28 per cent. About 15 per cent of respondents are self-employed, and the remaining 4 per cent are employers. Where hukou status is concerned, 23 per cent are rural migrant workers, which represents a sizable minority of the urban workforce.

Table 3 shows the cross-tabulation between pension participation and hukou status. It is clear that the extent of pension coverage and the pattern of pension participation differ markedly between rural migrant workers and urban hukou workers. The former are still far from being universally covered, totalling 52.9 per cent when participation in both the Employees' Pension and the Residents' Pension are combined. The latter have achieved a high coverage of 91 per cent. Another difference is that the former are less likely to join the Employees' Pension than the Residents' Pension (21.5 per cent versus 31.4 per cent), and the latter are more likely to join the Employees' Pension than and Residents' Pension (62.0 per cent versus 29.0 per cent).

Multinomial regression analysis

Finding 1: More equal participation in the Residents' Pension than in the Employees' Pension

Table 4 presents results from the multinomial regression analysis of pension participation. We report odds ratios so that a variable has a positive effect if its coefficient is greater than 1, thus statistically significant. Model 1 compares participation in the Employees' Pension versus no pension; Model 2 compares participation in the Residents' Pension versus no pension; and Model 3 compares participation in the Employees' Pension versus the Residents' Pension. In line with the majority of past studies (Jiang, Qian and Wen, 2018;

Table 4. *Multinomial regression analysis of pension participation among people with active employment in urban China*

	Model 1 Employees' pension vs. no pension	Model 2 Residents' pension vs. no pension	Model 3 Employees' pension vs. Residents' pension
male	0.77** (.07)	0.86* (.08)	0.90 (.08)
married	1.30 [†] (.19)	1.28 [†] (.14)	1.01 (.15)
<i>Age cohort</i> ¹			
cohort 1	8.87*** (2.27)	6.07*** (1.51)	1.46 (.36)
cohort 2	7.00*** (1.37)	5.50*** (1.07)	1.27 (.26)
cohort 3	3.95*** (.73)	3.49*** (.64)	1.13 (.22)
cohort 4	2.22*** (.37)	2.35*** (.40)	0.94 (.17)
<i>Education</i> ²			
junior secondary	3.14*** (.65)	1.36* (.19)	2.31*** (.48)
senior secondary	5.80*** (1.24)	1.79*** (.28)	3.24*** (.68)
college	13.35*** (3.05)	2.79*** (.50)	4.79*** (1.06)
<i>Employment status</i> ³			
formal employee	7.41*** (1.22)	1.14 (.13)	6.50*** (1.04)
informal employee	6.01*** (1.03)	1.17 (.14)	5.12*** (.86)
employer	1.53 (.42)	1.08 (.23)	1.42 (.36)
<i>Income quartile</i> ⁴			
high income	3.08*** (.47)	1.85*** (.27)	1.67*** (.24)
upper middle income	2.91*** (.38)	1.61*** (.20)	1.81*** (.23)
lower middle income	1.99*** (.25)	1.45*** (.17)	1.37** (.17)
<i>Hukou-migration</i> ⁵			
rural migrant	0.36*** (.05)	0.77* (.09)	0.47*** (.06)
Pseudo R2	0.17	0.17	0.17

Notes: N=4,189; odds ratios are reported; standard errors are in parentheses. ¹ reference group is primary education and below; ² reference group is cohort 5 (born in 1990 and after); ³ reference group is the self-employed; ⁴ reference group is low income; ⁵ reference group is urban hukou holder. *** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .10$.

Source: Data derived from the 2016 wave of China Labor-force Dynamics Survey (CLDS), collected by the Center for Social Science Survey at Sun Yat-sen University in Guangzhou, China. Please refer to <http://css.sysu.edu.cn> for more information about the CLDS data.

Qin, Zhuang and Liu, 2015; Xu, Guan and Yao, 2011), we find a female advantage in pension participation, regardless of whether it is for the Employees' Pension or the Residents' Pension. However, we find no gender effect between the two pension

schemes. A similar pattern is found for marital status. Those who are married are more likely to join the Employees' Pension or the Residents' Pension, but are as likely as those who are not married to participate in the Employees' Pension versus the Residents' Pension. Regarding the age effect, it is noteworthy that the older cohorts are considerably more likely to join the Employees' Pension or the Residents' Pension than younger cohorts. All other things being equal, cohort 1 – the group of those born in the 1950s – is 8.87 times more likely than the youngest cohort (the “post-90” generation) to join the Employees' Pension, and 6.07 times more likely to join the Residents' Pension. However, there are no intergenerational differences in preferring the Employees' Pension over the Residents' Pension, or vice versa.

The primary focus of our research is the effect of socioeconomic status on pension participation. In our analysis, socioeconomic status is measured by education, employment status, income, and hukou/migration status. We have argued that the Residents' Pension is categorically different from the Employees' Pension in terms of the structure, financing and pension benefits. Consequently, institutional exclusion and market/employer exclusion, which disadvantage urban workers of lower socioeconomic status in gaining access to the Employees' Pension, are absent in the Residents' Pension. Moreover, self-selection works differently between the two schemes. It tends to discourage urban workers of lower socioeconomic status from joining the Employees' Pension, but much less so for the Residents' Pension. Our first set of hypotheses therefore posits that participation is more equal in the Residents' Pension than for the Employees' Pension between groups with different socioeconomic status.

Table 4 presents solid evidence for this. Model 1 shows that in line with previous research, access to the Employees' Pension is highly unequal when comparing the more and the less educated, between formal employees and other groups, between higher and lower income groups, and between rural migrant workers and urban hukou workers. Within such broad patterns, our analysis also shows that the difference between formal employees and informal employees is substantially smaller than the difference between employers and self-employed individuals. Where income stratification is concerned, our analysis shows that the sharpest distinction is between the bottom quartile and the higher income groups.

Model 2 shows a considerably smaller gap in access to the Residents' Pension in each of the four dimensions of socioeconomic status. For instance, those with at least college education are 13.35 times more likely than those with primary (or no) education to participate in the Employees' Pension, but only 2.79 times more likely to participate in the Residents' Pension. Formal employees are 7.41 times more likely than self-employed individuals to join the Employees' Pension, but the difference disappears in the Residents' Pension. Rural migrant workers are 36 per cent as likely as urban hukou workers to be covered by the

Employees' Pension, and 77 per cent as likely in the case of the Residents' Pension. This would indicate that while rural migrant workers have disadvantaged access to both the Employees' Pension and the Residents' Pension, the latter is more accommodating than the former.

Model 3 compares participation in the Employees' Pension versus the Residents' Pension. It shows clearly that education has a large effect on access, and the effect is larger for those with a higher level of education. Our results show that the less educated are less disadvantaged in gaining access to the Residents' Pension than to the Employees' Pension. Employment status also matters for participation. Formal employees and informal employees are more likely than employers and self-employed individuals to join the Employees' Pension rather than the Residents' Pension. Income is another factor that affects pension participation. Those in the upper middle income quartile are 81 per cent more likely than those in the bottom quartile to join the Employees' Pension rather than the Residents' Pension; as are, in turn, those in the top quartile and those in the lower middle income quartile. Where the effect of hukou-migration is concerned, rural migrant workers are 47 per cent as likely as urban hukou workers to participate in the Employees' Pension rather than the Residents' Pension. To varying extents, the Residents' Pension is more accommodating than the Employees' Pension for those with lower education levels, the self-employed and employers, lower income earners, and rural migrant workers. Given the finding that access to the Residents' Pension is considerably more equal across groups stratified by education, employment status, income, or hukou-migration, the first set of hypotheses is strongly supported.

Finding 2: The Residents' Pension is more accommodating to lower status rural migrant workers than is the Employees' Pension

Table 4 treats rural migrant workers as a homogeneous group. Field studies highlight that they are heterogeneous in terms of education, employment, income, aspiration, needs, and so on (Huang and Guo 2017; Li, 2006; Zhan, 2011). In subsequent analyses, we take the heterogeneity of rural migrant workers into account by considering an interaction term, between hukou-migration and education, employment status, and income, respectively. Results from these analyses are used to test our second set of hypotheses that lower status rural migrant workers are less disadvantaged in accessing the Residents' Pension than the Employees' Pension, compared with urban hukou workers of similar status.

Table 5 reports results from the multinomial regression analysis with the interaction term between hukou-migration and education. We focus on Model 3, which compares the odds ratio of participation in the Employees' Pension versus

Table 5. Multinomial regression of pension participation among people with active employment in urban China, with the interaction term of hukou-migration and education

	Model 1	Model 2	Model 3
	Employees' pension vs. no pension	Residents' pension vs. no pension	Employees' pension vs. Residents' pension
male	0.78** (.07)	0.98+ (.08)	0.91 (.08)
married	1.31+ (.19)	1.29+ (0.19)	1.02 (.15)
<i>Age cohort</i> ¹			
cohort 1	8.78*** (2.26)	6.09*** (1.52)	1.44 (.35)
cohort 2	7.22*** (1.42)	5.61*** (1.10)	1.29 (.26)
cohort 3	4.17*** (.78)	3.61*** (.67)	1.15 (.23)
cohort 4	2.31*** (.39)	2.42*** (.41)	0.96 (.18)
<i>Education</i> ²			
junior secondary	2.40*** (.64)	1.30 (.29)	1.84* (.47)
senior secondary	4.14*** (.78)	1.55* (.35)	2.67*** (.68)
college	8.83*** (2.44)	2.33*** (.55)	3.79*** (.99)
<i>Employment</i> ³			
formal employee	7.45*** (1.23)	1.15 (.14)	6.50*** (1.03)
informal employee	6.05*** (1.04)	1.18 (.14)	5.14*** (.86)
employer	1.52 (.41)	1.08 (.23)	1.41 (.36)
<i>Income quartile</i> ⁴			
high income	3.13*** (.48)	1.86*** (.27)	1.68*** (.24)
upper middle income	2.99*** (.39)	1.64*** (.20)	1.82*** (.23)
lower middle income	2.03*** (.26)	1.47*** (.17)	1.38** (.17)
<i>Hukou-migration</i> ⁵			
rural migrant	0.16*** (.07)	0.65+ (.16)	0.25*** (.10)
<i>Interaction terms</i>			
rural migrant * junior secondary	1.82 (.81)	1.00 (.29)	1.83 (.82)
rural migrant * senior secondary	2.11 (.98)	1.34 (.43)	1.57 (.73)
rural migrant * college	4.70*** (2.25)	1.88+ (.69)	2.50* (1.19)
Pseudo R2	0.17	0.17	0.17

Notes: N=4,189; odds ratios are reported; standard errors are in parentheses. ¹ reference group is primary education and below; ² reference group is cohort 5 (born in 1990 and after); ³ reference group is the self-employed; ⁴ reference group is low income; ⁵ reference group is urban hukou holder. *** p<.001, ** p<.01, * p<.05, + p<.10.

Source: Data derived from the 2016 wave of China Labor-force Dynamics Survey (CLDS), collected by the Center for Social Science Survey at Sun Yat-sen University in Guangzhou, China. Please refer to <http://css.sysu.edu.cn> for more information about the CLDS data.

the Residents' Pension. It shows that rural migrant workers are 25 per cent as likely as urban hukou workers to participate in the Employees' Pension rather than the Residents' Pension. The large gap does not change until the educational level of rural migrant workers increases to college level. Among the college educated, rural migrant workers are 62.5 per cent ($0.25 \times 2.50 = 0.625$) as likely as urban hukou workers to join the Employees' Pension as opposed to the Residents' Pension. This would suggest that rural migrant workers require college education to partially overcome their disadvantage in gaining access to the Employees' Pension.

If we use urban hukou workers with primary or no education as the reference group, rural migrant workers with primary or no education are 25 per cent as likely to join the Employees' Pension as opposed to the Residents' Pension. The odds ratio increases to 46 per cent ($1.84 \times 0.25 = 0.46$) for rural migrant workers with junior secondary education; 184 per cent for urban hukou workers with junior secondary education; 67 per cent ($2.67 \times 0.25 \approx 0.67$) for rural migrant workers with senior secondary education; 267 per cent for urban hukou workers with senior secondary education; 237 per cent ($3.79 \times 0.25 \times 2.50 \approx 2.37$) for rural migrant workers with college education; and 379 per cent for urban hukou workers with college education. Clearly, rural migrant workers with lower levels of education are much less likely to be covered by the Employees' Pension as opposed to the Residents' Pension. Put alternatively, the Residents' Pension is more accommodating to the less educated rural migrant workers than the Employees' Pension. This finding evidently supports our second set of hypotheses.

Table 6 addresses the interaction term between hukou-migration and employment status. The statistically significant interaction effects in Model 3 suggest that the impact of employment status on participation in the Employees' Pension as opposed to the Residents' Pension indeed varies between rural migrant workers and urban hukou workers. If we use self-employed urban hukou holders as the reference group, self-employed rural migrants are 21 per cent as likely to join the Employees' Pension as opposed to the Residents' Pension. The odds ratio is 98 per cent ($0.21 \times 4.69 \approx 0.98$) for the group of rural migrants who are employers; 100 per cent for the group of urban hukou holders who are employers; 257 per cent for the group of rural migrants who are informal employees ($4.22 \times 0.21 \times 2.90 \approx 2.57$); 422 per cent for the group of urban hukou holders who are informal employees; 261 per cent for the group of rural migrants who are formal employees ($5.53 \times 0.21 \times 2.25 \approx 2.61$); and 553 per cent for the group of urban hukou holders who are formal employees.

The comparison shows that among all groups, self-employed rural migrants are the least likely to join the Employees' Pension as opposed to the Residents' Pension. Next, self-employed urban hukou holders and the group of employers (regardless of being rural migrants or urban hukou holders) are much alike in their preference. They are more likely than self-employed rural migrants but less likely

Table 6. Multinomial regression of pension participation among people with active employment in urban China, with the interaction term of hukou-migration and employment status

	Model 1	Model 2	Model 3
	Employees' pension vs. no pension	Residents' pension vs. no pension	Employees' pension vs. Residents' pension
male	0.77** (.07)	0.86+ (.08)	0.90 (.08)
married	1.29+ (.19)	1.28+ (.19)	1.01 (.15)
<i>Age cohort</i> ¹			
cohort 1	8.96*** (2.30)	6.02*** (1.50)	1.49 (.36)
cohort 2	7.02*** (1.38)	5.39*** (1.05)	1.30 (.26)
cohort 3	3.94*** (.73)	3.41*** (.63)	1.15 (.23)
cohort 4	2.22*** (.37)	2.33*** (.39)	0.95 (.17)
<i>Education</i> ²			
junior secondary	3.18*** (.66)	1.37* (.20)	2.32*** (.48)
senior secondary	5.91*** (1.26)	1.80*** (.28)	3.27*** (.69)
college	13.40*** (3.06)	2.75*** (.50)	4.88*** (1.08)
<i>Employment</i> ³			
formal employee	7.44*** (1.36)	1.34* (.20)	5.53*** (.96)
informal employee	5.40*** (1.04)	1.28 (.20)	4.22*** (.78)
employer	1.40 (.42)	1.26 (.31)	1.11 (.31)
<i>Income quartile</i> ⁴			
high income	3.07*** (.47)	1.84*** (.27)	1.66*** (.24)
upper middle income	2.91*** (.38)	1.60*** (.20)	1.81*** (.23)
lower middle income	1.97*** (.25)	1.44** (.17)	1.37** (.17)
<i>Hukou-migration</i> ⁵			
rural migrant	0.21*** (.09)	0.99 (.18)	0.21*** (.10)
<i>Interaction terms</i>			
rural migrant * formal employee	1.44 (.69)	0.64+ (.15)	2.25+(1.09)
rural migrant * informal employee	2.29+(1.12)	0.79 (.19)	2.90* (1.42)
rural migrant * employer	2.80 (2.07)	0.60 (.29)	4.69* (3.50)
Pseudo R2	0.17	0.17	0.17

Notes: N=4,189; odds ratios are reported; standard errors are in parentheses. ¹ reference group is primary education and below; ² reference group is cohort 5 (born in 1990 and after); ³ reference group is the self-employed; ⁴ reference group is low income; ⁵ reference group is urban hukou holder. *** p<.001, ** p<.01, * p<.05, + p<.10.

Source: Data derived from the 2016 wave of China Labor-force Dynamics Survey (CLDS), collected by the Center for Social Science Survey at Sun Yat-sen University in Guangzhou, China. Please refer to <http://css.sysu.edu.cn> for more information about the CLDS data.

Table 7. *Multinomial regression of pension participation among people with active employment in urban China, with the interaction term of hukou-migration and income quartile*

	Model 1	Model 2	Model 3
	Employees' pension vs. no pension	Residents' pension vs. no pension	Employees' pension vs. Residents' pension
male	0.78** (.07)	0.86 ⁺ (.08)	0.90 (.08)
married	1.30 ⁺ (.19)	1.28 ⁺ (.19)	1.01 (.15)
<i>Age cohort</i> ¹			
cohort 1	8.83*** (2.27)	6.07*** (1.51)	1.46 (.36)
cohort 2	6.97*** (1.37)	5.52*** (1.07)	1.26 (.25)
cohort 3	3.93*** (.73)	3.50*** (.65)	1.12 (.22)
cohort 4	2.20*** (.37)	2.35*** (.40)	0.94 (.17)
<i>Education</i> ²			
junior secondary	3.16*** (.66)	1.35*** (.19)	2.34*** (.49)
senior secondary	5.85*** (1.26)	1.80*** (.29)	3.25*** (.69)
college	13.68*** (3.13)	2.81*** (.51)	4.87*** (1.08)
<i>Employment</i> ³			
formal employee	7.47*** (1.23)	1.14 (.13)	6.54*** (1.04)
informal employee	6.01*** (1.03)	1.17 (.14)	5.14*** (.86)
employer	1.56 (.42)	1.10 (.24)	1.42 (.36)
<i>Income quartile</i> ⁴			
high income	2.60*** (.44)	1.79*** (.30)	1.45** (.22)
upper middle income	2.48*** (.36)	1.35* (.20)	1.83*** (.25)
lower middle income	1.66*** (.24)	1.36* (.19)	1.22 (.16)
<i>Hukou-migration</i> ⁵			
rural migrant	0.15*** (.05)	0.67* (.12)	0.22*** (.07)
<i>Interaction terms</i>			
rural migrant* high income	3.54** (1.42)	0.97 (.27)	3.66** (1.50)
rural migrant* upper middle income	2.42* (.93)	1.64* (.41)	1.47 (.57)
rural migrant* lower middle income	3.50*** (1.33)	1.14 (.28)	3.07** (1.21)
Pseudo R2	0.17	0.17	0.17

Notes: N=4,189; odds ratios are reported; standard errors are in parentheses. ¹ reference group is primary education and below; ² reference group is cohort 5 (born in 1990 and after); ³ reference group is the self-employed; ⁴ reference group is low income; ⁵ reference group is urban hukou holder. *** p<.001, ** p<.01, * p<.05, + p<.10.

Source: Data derived from the 2016 wave of China Labor-force Dynamics Survey (CLDS), collected by the Center for Social Science Survey at Sun Yat-sen University in Guangzhou, China. Please refer to <http://css.sysu.edu.cn> for more information about the CLDS data.

than employees to join the Employees' Pension versus the Residents' Pension. Among employees, in ascending order, rural migrants who are informal employees or formal employees, urban hukou holders who are informal employees, and urban hukou holders who are formal employees are increasingly more likely to join the Employees' Pension than the Residents' Pension. Conversely, the Residents' Pension is more accommodating to the group of self-employed rural migrants than any other group. This finding fits well with our second set of analyses. Overall, except for the group of employers, in which rural migrants and urban hukou holders have little difference in choosing the pension scheme, the odd ratio of participation in the Residents' Pension as opposed to the Employees' Pension is always higher for rural migrant workers than for urban hukou holders when they have the same employment status.

Table 7 changes the interaction term to hukou-migration and income quartile. Model 3 compares the odds ratio of participation in the Employees' Pension versus Residents' Pension. If we combine the main effect of income quartile and hukou-migration and their interaction effect, we find that rural migrant workers in the bottom income quartile are the most disadvantaged group in terms of participation in the Employees' Pension as opposed to the Residents' Pension. If urban hukou workers in the lowest income quartile are used as the comparison group, rural migrant workers in the lowest income quartile are 22 per cent as likely to join the Employees' Pension as opposed to the Residents' Pension. The odds ratio increases to 67.5 per cent ($0.22 \times 3.07 \approx 0.675$) for rural migrant workers in the lower middle income quartile; 100 per cent for urban hukou workers in the lower middle income quartile; 40.3 per cent ($1.83 \times 0.22 \approx 0.403$) for rural migrant workers in the upper middle income quartile; 183 per cent for urban hukou workers in the upper middle income quartile; 117 per cent ($1.45 \times 0.22 \times 3.66 \approx 1.17$) for rural migrant workers in the top income quartile; and 145 per cent for urban hukou workers in the top income quartile. Conversely, among those who are covered by either the Employees' Pension or the Residents' Pension, rural migrant workers in the lowest income quartile are more likely to choose the Residents' Pension than any other groups. Seen in this light, Model 3 in Table 7 lends some support to our second set of hypotheses that the Residents' Pension is more accommodating to lower status rural migrant workers than the Employees' Pension, even though groups in the middle income quartiles do not neatly follow this pattern.

Conclusion and discussion

Similar to many developing economies, achieving universal pension coverage is both an aspiration and a challenge for China. To make progress in this regard, China set up a contributory pension system for urban employees in 1997. To

achieve universal coverage, China established a scheme for rural residents (since 2009) and urban residents (since 2012) partly financed by government as well as being contributory. As of 2014, the merged Residents' Pension has a social pension component and a contributory component that also allows participants to choose the amount of contribution. Another notable feature is that coverage is open to all, including urban employees who are excluded from, or who opt out of, the Employees' Pension. China's pension reforms, therefore, provide a quasi-experiment for a rigorous test of the effects of pension schemes built on different principles with different features for pension coverage extension, particularly as regards individuals/groups of lower socioeconomic status.

Based on nationally representative survey data collected in China in 2016, we have analysed how those eligible for both the Employees' Pension and the Residents' Pension decide on the nature of their pension participation. We have paid special attention to lower status individuals, namely those with lower levels of education, those in informal employment or self-employment, and with lower earnings. Our main findings are twofold.

First, access to the Residents' Pension is more equal than for the Employees' Pension. The participation gap between the more educated and the less educated is considerably smaller in the Residents' Pension than in the Employees' Pension. The same pattern is found across groups with different employment status, in different income quartiles, and between rural migrant workers and urban hukou holders. Among those who have joined the Employees' Pension or the Residents' Pension, those with lower levels of education are more likely than the more educated to choose the Residents' Pension (as opposed to the Employees' Pension). Similarly, self-employed individuals and employers are more likely than formal employees and informal employees to join the Residents' Pension; just as those in the lower income quartiles are more likely to do so than those in the upper quartiles, and rural migrant workers are more likely than urban hukou holders.

Second, we find that lower status rural migrant workers are less disadvantaged in joining the Residents' scheme than the Employees' Pension. Our analysis shows that a lower status rural migrant worker is triply disadvantaged in gaining access to the Employees' Pension; namely, because of the effect of having a lower status, the effect of being a rural migrant worker, and the interaction effect of having a lower status and being a migrant worker. In comparison, a lower status urban hukou worker is only penalized for his or her lower status in gaining access to the Employees' Pension. The Residents' Pension substantially reduces each of the three disadvantages facing lower status rural migrant workers. Consequently, the most disadvantaged group under the Employees' Pension is found to benefit most from the introduction of the Residents' Pension.

Our study makes a number of contributions to the literature. Empirically, we present clear evidence that the Residents' Pension in China is effective in pension coverage extension. It is effective because the lower status workforce evidently prefer the Residents' Pension to the Employees' Pension. Theoretically, we provide an account of why the hybrid Residents' Pension is more effective in pension coverage extension than the more conventional contributory Employees' Pension. The existing literature suggests that the three mechanisms of institutional exclusion, market/employer exclusion and self-selection reinforce each other to disadvantage lower status workers in access to the Employees' Pension. We move a step further to argue that the same statement does not hold for the Residents' Pension, wherein self-selection is the major determinant, but works in a different way. Many lower status workers choose to join the Residents' Pension, because it is flexible and affordable without many of the shortcomings inherent in the Employees' Pension. Put differently, while our analysis confirms that self-selection is shaped by socioeconomic inequalities and institutions (such as the hukou system), it also shows that the impact of socioeconomic inequalities and institutions on self-selection varies substantially across schemes with different features.

Concerning policy-making, our study suggests that alternative pension schemes can take many forms. The literature largely focuses on tax-financed social pensions as an exemplary model for achieving the goal of universal coverage (Aguila et al., 2016; Alfers, Lund and Moussie, 2017; Barrientos, 2013; Deacon, 2013; Ferguson, 2015). In this vein, some studies describe China's Residents' Pension as a social pension (Liu and Sun, 2016; Wang, Williamson and Cansoy, 2016). We concur that the Residents' Pension in China is a sufficiently different alternative to the contributory Employees' Pension, and a better performing one in terms of pension coverage extension. Nonetheless, we highlight that the Residents' Pension is not a classical tax-financed social pension. It certainly has a social pension component; but it also has a contributory component. The contributory component is built into the Residents' Pension because it epitomizes the principle of self-responsibility valued by Confucian culture. A non-contributory social pension is not necessarily the only option. More attention should be paid to the cultural underpinnings of welfare provision and social protection. Where pension coverage extension is concerned, the key issue is not whether the pension scheme is contributory or non-contributory, but whether it is flexible, affordable and responsive to the diverse needs of the population, and whether it fits squarely with the cultural context.

While our findings show that rural migrant workers are a diverse group, more research is required to understand how self-selection works within this group. Nearly half of rural migrant workers in our analysis are not covered by either the Employees' Pension or the Residents' Pension. Past research suggests that rural

migrant workers are heterogeneous, not only in terms of education, employment and income, but also in terms of settlement intention (Cao et al., 2015; Fan, 2011; Yue et al., 2010; Zhu, 2007). Some prefer to settle permanently in cities, some plan to return home upon retirement, while others do not rule out the possibility of returning home to farm or enter non-agricultural employment. For those who prefer to settle permanently in cities or are undecided about their future settlement, the available pension options probably are not attractive. The Employees' Pension may be as unattractive to this group as it is to other migrant workers; the Residents' Pension, which requires them to register, make payments and receive pension in their home counties, is less suited to their needs than to those considering to return "home" permanently in the future. We are not able to examine how settlement intention affects rural migrant workers' pension participation.

Also missing in our analysis is the impact of trust (or lack of it) on pension scheme participation, which is identified in past field studies as an important factor prompting migrant workers to opt out of the Employees' Pension (Huang and Guo, 2017; Zhan, 2011). Future research should pay more attention to these factors. Notably, China has been lifting hukou restrictions in recent years. In April 2020, the Chinese government announced a new policy that cities with a population of less than 3 million citizens should remove barriers for rural residents to apply for an urban hukou. For cities with a population greater than 3 million, hukou barriers should be lowered for some groups, such as migrant workers with stable jobs and college students from rural areas. It is important to examine how such hukou reforms might affect migrant workers' settlement intention and pension scheme participation. Finally, while the Residents' Pension has played a large and indispensable role in pension coverage extension in China, its low benefit levels have raised the important issue of pension adequacy.

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