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Social Protection for the Labour Force of Informal Sector in Urban China: Institutional Constraints and Self-selection Behaviour*

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Abstract:

The Chinese government has recently expanded the scope of urban social insurance programmes. However, social protection for the labour force of urban informal sector, which reaches about half the number of urban workers, lags significantly behind. This under-coverage may be due to institutional constraints, particularly the household registration system (*hukou*), and self-selection behaviour related to the limited benefits of social insurance. Drawing on a recent nationwide individual-level survey and city-level statistics, this study examines these two explanations for the under-enrolment of social insurance programme. First, results suggest that *hukou* and the intergovernmental fiscal system are major institutional constraints. Second, self-selection behaviour in programme enrolment is verified. Employers in the informal sector are likely to opt out of social insurance. More importantly, employers in the informal sector with rural or non-local *hukou* are also likely to opt out of social insurance, which suggests that self-selection behaviour is constrained by institutions. Such findings have important implications for broad theoretical and policy debates on universal social protection.

Key words: social protection, social insurance programme, informal sector, institutional constraints, self-selection, China

Introduction

Renewed concern has emerged for the universal coverage of social protection because of restricted livelihood opportunities and high levels of poverty under globalisation labour market segmentation (Canagarajah and Sethuraman, 2001; United Nations Research Institute for Social Development [UNRISD], 2012; International Labour Organization [ILO], 2014). The recent joint statement on universal social protection initiative by the World Bank Group and ILO indicated that universal social protection refers to ‘the integrated set of policies designed to ensure income security and support to people across the life cycle by paying particular attention to the poor and the vulnerable’ (ILO, 2015). Therefore, two conditions must be fulfilled for universal coverage: (1) everyone should enrol in a social programme and (2) sufficient financial protection must be provided for each enrollee.

Many developed and developing countries adopt social insurance programmes to secure protection from income insecurity caused by sickness, maternity, employment injury, unemployment and old age (Kim, 2001; ILO, 2014; Kim, 2016). The outcomes of the interaction between social insurance and labour market policies in developed countries have long been heatedly debated. These debates have highlighted the role of institutional constraints, particularly labour market structure and policy regulation, in restricting universal access to social protection. For example, discussions on increasing conditionalities on contribution and work requirement for social insurance are ongoing (Sjöberg, 1999; Shutes, 2016). Other discussions on institutional constraints in this context include liberalisation or dualisation of pension and unemployment policy reforms and their impacts on an insider–outsider social division (Erlinghagen and Knuth, 2010; Clasen and Goerne, 2011; Bridgen and Meyer, 2014).

China adopts the social insurance approach to protect its citizens. Since the mid-1980s, the Chinese government has initiated various types of social insurance to settle the social unrest of millions of laid-off urban workers and facilitate the reform of state-owned enterprises (Wong and Ngok, 2006; Hu, 2015). However, the social protection for the labour force of the urban informal sector generally lags significantly behind in China (Kumar and Li, 2007; Rickne, 2013; Guo, et al., 2016). Following the literature, the current study defines the informal sector labour force as working people

with informality in either outside the formal sector enterprises (e.g. urban-registered private enterprises, most of which are small scaled, or individual businesses), or employment relation (e.g. without a written contract, flexibly employed or self-employed).

The number of urban labour force that work outside the formal sector enterprises has accounted for over half of the total urban labour force in recent years. Given the large size of this sector, the social protection for its members has a significant impact over social and economic developments for three reasons. First, it is important to achieve a universal coverage by protecting people at high risks in health and employment (Wang et al., 2015). Furthermore, a broad enrolment of social insurance is pivotal when aging becomes a serious concern in China. Continuous contribution from a majority of the working age population is crucial for the financial sustainability of social insurance. The third reason is that, China has highlighted the economic strategy as an innovation-driven economy in the 13th Five-Year Plan (2016–2020). A broad coverage of social safety net beyond the urban formal sector encourages risk-taking innovation, entrepreneurship and the formation of a flexible labour market (Guo and Wang, 2016).

Compared with the formal sector counterparts, the informal sector labour force is less likely to enrol in social insurance for two possible reasons. First, the institutional discrimination of *hukou* (household registration status) and the occupation-based welfare regime persist (Ringen and Ngok, 2013). Some informal sector labours are not fully eligible to enrol for social insurance programmes if they do not have a local *hukou* or written labour contract. Second, given the weak enforcement of labour inspection, the informal labour force (e.g. self-employed and flexibly employed workers) possesses considerable discretion to determine their enrolment than those working in the formal sector. Members of the informal labour force may voluntarily opt out of a social insurance.

Since 2003, the Chinese government has begun to shift its governance priority to social policy, including the provision of a universal social protection coverage (Wang, 2008). Two main developments may encourage the labour force of the informal sector to enrol in social insurance. First, new social programmes have been initiated to cover social groups that were previously excluded in social insurances. In

the 2000s, the government initiated pension schemes and health insurances for urban and rural residents, flexibly employed, peasants and migrant workers (Gao, et al., 2013; Giles, et al., 2013; Huang, 2014; Ngok, 2016).

Second, the *hukou* constraint was relaxed in 2002 in terms of public service access. One of the signature initiatives in local policy experiments is to grant migrant workers (workers without local *hukou*) equal access to social insurance programmes. Migrant workers who have local residence status and labour contracts can access social insurance programmes that were previously accessible to local urban workers only. Accordingly, the insider–outsider boundary is shifting from a rigid urban–rural division to a within–without criterion (Shi, 2012; Cheng et al., 2014).

Overall, social insurance programmes have been reconfigured to become further inclusive and universal; however, questions exist regarding these two recent moves in achieving universal coverage. *Hukou* and occupation-based elements may remain pervasive after the expansion of social protection because social insurance is managed by the local government, and most social benefits are not portable across cities and regions (Ringen and Ngok, 2013).

The current research investigates the determinants of enrolment in social insurance for the informal sector labour force in urban China in light of the preceding discussion. This study draws on the nationally representative survey data collected in 2012, and determines that the labour force of the informal sector has significant disadvantages in social protection. The non-local and rural *hukou* and the intergovernmental fiscal system are major institutional constraints in achieving a universal coverage of social protection. The present study suggests that the informal sector workers who have urban and local *hukou* and reside in a city with large fiscal capacity are likely to enrol in social insurances. Also, employers of the urban informal sector, who have more discretion than employees over their enrolment status, are likely to self-select to opt out of social insurances. In addition, the self-selection behaviour is constrained by institutions, such as *hukou*. Employers in the urban informal sector without local or urban *hukou* are likely to opt out of social insurances than those with *hukou*.

The contributions of this research are threefold. First, this study provides a comprehensive view of social insurance coverage based on nationally representative

individual- and city-level data. Furthermore, this study is the first thorough investigation of the disadvantages of the informal sector labour force in social protection in urban China. Institutional constraints and self-selection behaviour are highlighted as reasons for the undercoverage of social programmes for the labour force of the urban informal sector. Last but not least, this research reveals the interaction between self-selection behaviour and institutional constraints. The integrative explanation of institutional arrangement and individual behaviour provides new insights into the understanding of the undercoverage of social protection for the informal sector labour force.

Informal Sector Labour Force and Fragmented Social Insurance in China

The definition of informal sector is extensively discussed in the literature. ILO has adopted the concept of informal sector as one that describes the profit-making activities that are ‘small in scale and limited by simple technologies, little capital and lack of links with the other sector’ (Bangasser, 2000). In 2003, the 17th International Conference of Labour Statisticians endorsed to complement the enterprise-based definition of informal sector with an extensive, labour-based concept of informal employment. ILO supported the measurement adjustment to include both ‘employment in the informal sector’ and ‘informal employment’ as the informal sector (Husmanns, 2004).

The current research follows the literature to include two non-exclusive groups as the labour force of the urban informal sector. The first group is defined by the registration status of enterprises. The urban informal sector includes registered private enterprises and individual businesses. In China, the majority of private enterprises are small-scale. The average number of employees in a private enterprise in 2013 was approximately 10.4 (National Bureau of Statistics [NBS], 2013). A nationwide survey indicated that only 1.1% of private enterprises had over 100 employees in 2005 (Huang, 2013). In this context, private enterprises are generally considered the informal sector in the literature (Ghose, 2005; Hu and Zhao, 2006). The second group is defined by the type of employment relation. Individuals without a written employment contract are categorised under informal employment (Ghose, 2005; Kumar and Li, 2007; Park and

Cai, 2011). The informal sector labour force for both groups can be employees or (self) employers.

The current fragmented social insurance regime in China exacerbates the undercoverage of the informal sector labour force. The fragmentation has two dimensions, namely, rural–urban/regional division and occupation-based programmes (Ngok, 2016). The first type of fragmentation is based on the *hukou* status and locality. Chinese people under the *hukou* system are divided into two categories, namely, rural and urban residents. *Hukou* also divides people based on their residence location. Significant differences are identified between rural and urban residents, as well as amongst residents across different regions, in terms of the scope, coverage and benefit levels of social insurance programmes (Gao, et al., 2013; Ngok, 2016).

The second fragmentation type is based on occupations and employment sectors. Public servants and urban workers belong to different social insurance programmes (Ringen and Ngok, 2013; Ngok, 2016). In recent years, new programmes that target local residents without formal employment have been initiated in several metropolises.¹ This two-dimensional fragmentation currently makes interregional and cross-category transfers nearly impossible. These institutional settings decrease the effectiveness of risk pooling and financial protection.

Against the institutional context, the loose enforcement of labour inspection causes the enrolment of social insurance programmes for the urban informal sector to be generally dependent on the decision of employers and employees. In the current research, ‘employers’ in the informal sector refer to the self-employed and small business owners. Employers can decide on their own whether to enrol in social insurance programmes. ‘Employees’ in the informal sector include workers with informal employment and workers hired by small businesses. For employees, enrolment in social insurance requires contributions paid by employers and employees in proportion to their payrolls and wages. Table 1 summarises the contribution rates to each social insurance programme. Contribution and benefit varies across social insurances. Regarding to those urban basic employee programmes, the contributions are proportional to payroll and wage of individuals. The benefits (except for the pension programme) are not contribution-related and often based on the economic conditions of a particular city. In terms of the pension and health insurance for urban

residents (not the case for another three insurances), the contributions and benefits are in a lump sum decided by the local government.

--- Table 1 approximately here ---

The decision of employers in the informal sector on whether to contribute to the social insurance account of their employees can have an impact on the enrolment status of the latter (Guo et al., 2016). Although employers in the informal sector can opt not to contribute to their employees' accounts in pension or health insurance plans, the latter can constantly register for urban resident plans for pension and health insurance, for which the contribution from the former is unnecessary. Hence, employers and employees in the informal sector can make enrolment decisions. Nevertheless, employers in the informal sector have more substantial discretion for their enrolment in social insurance than employees.

Institutional Constraints and Self-selection Behaviour

The enrolment of social programmes is the result of interaction between institutions and actors. Studies on labour market segmentation and social protection for the labour force of the informal sector (van Ginneken, 1999; Pellissery and Walker, 2007; Shaefer, 2010) have identified the following main pervasive factors that contribute to inadequate coverage:

- (1) Government's institutional settings: extent of the benefits, institutional restrictions on enrolment eligibility, and administrative barriers on re-enrolment and portability of social benefits.
- (2) Employers and employees' resistance: low financial and policy literacy, distrust in public institutions and insurance programmes, unattractive programme design and additional financial costs.

The current study suggests that institutional constraints and self-selection are crucial determinants of enrolment in social insurance programmes by the labour force of the urban informal sector. Institutional constraints in this study refer to specific rules, procedures and practices that are treated as given for individuals who create patterned behaviour and interactions (Lowndes and Roerts, 2013). *Hukou* is a major

institutional constraint for programme enrolment in China. The labour market in China is dichotomised between rural and urban areas, as well as varies across regions. Rural and non-local *hukou* may be institutional barriers that create higher enrolment costs of social insurance programmes for the informal sector labour force than those created by local urban *hukou*. For example, the unemployment insurance benefits in Beijing can only be claimed from the place where the *hukou* of the beneficiary is registered. Accordingly, claiming benefits is difficult for those whose *hukou* is not registered in Beijing.² Thus, the informal sector workers with rural and non-local *hukou* are unlikely to enrol in social insurance programmes. In 2014, only 16.4% of rural migrant workers contributed to a basic pension scheme; 18.2% and 9.8% registered for health and unemployment insurances, respectively (NBS, 2015). These figures are significantly below the average in urban China.

Hukou has been discussed as an institutional constraint for social insurance participation in several empirical studies. Moreover, various studies based on city-level survey and national panel data showed that the members of the informal sector labour force who are employed by private enterprises or who are self-employed, particularly migrant workers without local *hukou*, are unlikely to be covered by employment-based social insurance programmes in urban China (Gao et al., 2012; Park et al., 2012; Chen and Gallagher, 2013; Giles et al., 2013; Gao and Rickne, 2015). These findings are consistent with those of other similar household surveys in Shanghai (Nyland et al., 2006) and Jiangsu Province (Nielsen et al., 2005).

The intergovernmental fiscal system which determines the local fiscal capacity is another major institutional constraint. Sufficient local fiscal capacity is pivotal to expand the coverage and improve the benefits of social insurance. From 2003 to 2009, the coverage for rural residents under the New Rural Cooperative Health Scheme increased from 13% to 94% because of government subsidies that accounted for nearly 90% of contributions (Barber and Yao, 2010). The majority share of government subsidy has been financed by the local government. For example, the local government provided approximately 56% of subsidy for urban resident health insurance in 2012³. However, the current intergovernmental fiscal system mandates that major tax revenue is assigned to the central government, whereas responsibilities for financing and providing public services have been delegated to the local government (Wong and Bird, 2008). In 2015, the local government accounted for over 86% of the total

government expenditure but approximately 54% of the total government revenue⁴. In this context, local governments with limited fiscal capacity may provide social insurance only for residents with local and urban *hukou*, and may lack strong incentives to implement universal coverage and improve the benefit level. This situation is the spatial injustice outcome of territorial fragmentation which localises and regionalises social protection (Shi, 2012; Ngok, 2016).

Self-selection in the current study refers to the purposeful actions of people in response to a state policy. The self-selection behaviour of the informal sector labour force for social insurance enrolment is based on the assumption of self-interest of individuals and their rational analysis of risks, costs and benefits (Rueda, 2005; Blekesaune, 2007). A few members of the urban informal sector may opt to forego enrolling in social programmes if the benefits are trivial.

Employers in the informal sector are likely to forego enrolling with social insurance; they have considerable discretion over their own enrolment status. The regressive effect of social insurance (Liu et al., 2015) and limited portability of social benefits under the decentralised and regionalised social insurance (Shi, 2012) may discourage the informal sector employers from enrolling in social insurance in two aspects. First, if informal sector employers believe that the benefit of social insurance programmes is not good enough, they are more likely to opt out compared to employees. Second, informal sector employers who lack a local or urban *hukou* are likely to opt out of social insurance programmes because they are unlikely to enjoy the benefit of social insurance.

In short, the labour force of the urban informal sector is refrained from enrolling in social insurance by institutional constraints (e.g. *hukou*). The labour force of the informal sector, particularly employers, may also opt out of social insurance programmes if the financial benefits of the social insurance are insufficient. Employers with rural or non-local *hukou* are even more likely to opt out of social insurance programmes compared to other employers.

Methods

Data

This study draws on individual- and city-level data. Individual-level data are sourced from the China Labour-force Dynamics Survey (CLDS) 2012, a nationally representative household survey conducted by Sun Yat-sen University, China.⁵ CLDS 2012 focused on the labour dynamics in China and included the detailed information of individuals related to the labour market. CLDS respondents were labourers aged 15 to 64 and selected from the 29 provinces of Mainland China, excluding Tibet and Hainan (see details on the CLDS 2012 in the Appendix).

The analysis is restricted to a sample of urban individuals who are engaged in non-farming work. A total of 3,160 individuals from 57 city-level units are extracted from CLDS 2012. Individual-level data are merged with contextual data for 57 city-level units in 2011. The data are drawn from the China Premium Database⁶ which provides city-level statistics.

The combined data sets have three main advantages when analysing social insurance for the labour force of the informal sector. To start with, the data set that comprises the official statistics of 57 cities and individual-level observations in China considers regional variations. Prior studies suggested substantial regional variations in social insurance enrolment. For example, the coverage rate of health insurance for all individuals aged 16 to 60 in Shanghai (89%) is more than twice the rate in Wuhan (39%) (Giles et al., 2006, 2013). CLDS 2012 with city-level statistics prompted the critical analysis of the national development of social insurance programmes whilst considering the city-level variations. Large variations in the contextual variables across cities provide adequate statistical power to analyse the influence of city-level characteristics on the programme enrolment of individuals.

In addition, the CLDS data set included a large number of observations of migrant workers which are crucial for analysing the social protection for the urban labour force. China has witnessed a significant increase in the number of migrant workers with the rural *hukou* working in urban areas. However, the inclusion of migrant workers in household surveys is a challenge because they cannot be identified in official registrations (Gustafsson et al., 2014). The current study draws on an

inclusive sample from CLDS 2012 with migrants and non-migrants, as well as provides accurate estimations of the social protection for the entire labour force of the informal sector.

Last but not least, the data reflect the updated policy outcomes amidst social protection expansion. In the era of social reform, the Labour Contract Law and Social Insurance Law were implemented in 2008 and 2011, respectively. CLDS 2012 precisely covered the social protection expansion and the enactment of policy regulation in China since 2003 (Shi, 2012; Gao et al., 2013; Ringen and Ngok, 2013; Huang, 2014).

Measures

The dependent variables are enrolments in three types of social insurance programmes: (1) basic employee/resident pension schemes, (2) urban employee/resident basic health insurance and (3) other types of social insurance, including unemployment, work-related injury and maternity insurance. To avoid underestimating the social insurance coverage in urban areas, the enrolment status is considered positive if individuals enrol with any social insurance programmes for urban workers or residents. Data analysis also includes the enrolment status of private commercial pension and health insurance as dependent variables for robustness check.

Informal Sector Employment (formal = 0) refers to people who work in private enterprises and individual businesses, as well as individuals under informal employment (i.e. working without a written contract or flexibly employed). (See details in the Appendix).

Institutional constraints are measured as the *hukou* status of individuals and fiscal revenue per capita of a city. The *hukou* status is classified into urban/rural and local/non-local. The city-level fiscal revenue is measured in per capita of 2011 and in RMB 1,000 (approximately USD 145). The fiscal revenue and other city-level controls are measured in their lagged value to avoid endogeneity problem in regression analysis (i.e. 2011 statistics).

Self-selection behaviour is measured by employment status. Employers in the informal sector have considerable discretion over their own enrolment status. If

employers are likely to opt out or enrol in social insurance programmes, then the finding implies the *self-selection behaviour* of employers.

Individual-level characteristics are controlled, including three dummy variables (i.e. gender (male = 0), work status (employed = 0) and employment status (employee = 0)) and three continuous variables (i.e. education (years of schooling), age and income). The income variable is considered in the logarithm.

City-level contextual measures are also included as controls, including gross domestic product (GDP) per capita, social security and employment expenditure and government health expenditure for 2011; these measures are measured in per capita. Social security and employment expenditure includes government expenditure under the Minimum Livelihood Guarantee Scheme (*Dibao*), as well as basic social assistance government expenditures on social security subsidies and expenditures for retired government employees. Social security and employment expenditures cover programme benefits. These benefits mainly target people who are not working in the formal sector, such as retirees and beneficiaries of social assistance programmes. Social security and employment expenditure per capita is a relevant variable because the benefit of social assistance programmes may affect the enrolment rate of social insurance types. For example, medical assistance is a social assistance programme that provides financial coverage for the health care of the urban poor. Similarly, the *Dibao* programme provides financial coverage for the urban poor who may be unemployed as well. A few urban workers in the informal sector may want to claim benefits from social assistance and not enrol in social insurance, such as unemployment or health insurance types. Thus, the enrolment rate of social insurance may be decreased if the benefit level of social assistance is sufficiently high (Qian and Mok 2016).

Moreover, the enrolment rate is affected by the benefit level of social insurance; such benefit level is increased with local social expenditure. The official number of city-level government budget allocated for social insurance is unavailable. Thus, government health expenditure is used as a proxy to measure the benefit of social insurance.

Analytic Strategy

A multilevel mixed-effect binary logistic regression model is employed to analyse the data. The first set of analyses evaluates the advantages of the informal sector labour force in terms of enrolment in social insurance programmes. Individual-level control variables include gender, employment status, education, age and income. The vectors of city-level variables, including GDP per capita, fiscal revenue per capita, social security and employment expenditure per capita and government health expenditure per capita, are also controlled.

The second set of analyses focuses on the labour force of the urban informal sector and analyses the determinants of their programme enrolments. The effects of the two types of *hukou* status (i.e. basic control and city-level contextual variables) are analysed.

Results

Descriptive Statistics

In the analysis sample of 3,160 individuals, 2,067 are the informal sector labour force, thereby accounting for 65.4% of the total working sample (see Table A1 in the Appendix for the descriptive statistics of the individual variables). On the basis of the registration status of enterprises, a few scholars used data in statistical yearbooks to estimate that the share of the urban informal sector workers was 56.8% in 2002 (Ghose, 2005, p. 27) and 58.7% by 2004 (Hu and Zhao, 2006). In the sample of the current study, the number of workers in the informal sector enterprises is 1,635 (51.7% of the total observations in 2012) which is consistent with the yearbook data cited in the literature. However, the definition of the informal sector in the present study is broader than that in the yearbook because the former also includes workers under informal employment (i.e. without a formal labour contract) but working in the formal sector enterprises⁷. The percentage of informal employment in the formal sector in 2012 is 13.7% of the analysis sample (see Table A2 in the Appendix). This ratio is also consistent with findings in other studies. Xue and Gao (2012) estimated that informal employment in the formal sector accounted for approximately 11.1% of the

total urban labour force based on the 2005 China One Percent Population Sample Survey, which was conducted by National Bureau of Statistics. The relatively high proportion of the informal labour force reported in the current study is therefore conceivable because the informal employment in the formal sector is also included.

The descriptive statistics also shows that enrolment in social insurance programmes is not universal. The figures in Table 2 suggest that the enrolment rate of the formal labour force ranges from 78% to 95% which is nearly twice that of the labour force of the informal sector. The labour force of the informal sector comprises the employees and employers (including self-employed and small business owners). In our sample, over 70% of the employers are reported as self-employed (see Figure A1 in the Appendix for details). For the informal labour sector, the programme enrolment rates of employers are lower than those of employees. Table A3 summarises the descriptive statistics of the contextual variables for the 57 city-level divisions (see Appendix).

--- Table 2 approximately here ---

Disadvantage of the Informal Sector in the Programme Enrolments

Table 3 presents the results of the mixed-effect logistic regression models that predict the likelihood of enrolment in three types of social insurance programmes, namely, pension, health insurance and other social insurance programmes. The differences between the labour force of the formal and informal sectors are compared in terms of their accessibility to the three types of social insurance programmes which are conditional on the individual- and city-level characteristics. The results reported in Table 3 suggest that the social protection of the informal sector labour force is less than that of the formal sector labour force. For the labour force of the formal and informal sectors, the rural *hukou*, non-local *hukou*, fiscal capacity, income and education are positively correlated with the likelihood of programme enrolment.

--- Table 3 approximately here ---

Determinants of Programme Enrolment: Institutional Constraints

Table 4 shows the estimated multilevel mixed-effect logistic regression models that predict the probability of insurance programme enrolment for the labour force of the informal sector. The results reveal that the rural and non-local *hukou* statuses are significant *institutional constraints* to achieve the universal coverage of social insurance, particularly for enrolment in Models 1, 2 and 3. The findings support the argument that the labour force of the informal sector with non-local and rural *hukou* is less likely to enrol in social insurance programmes. The significance of the urban/rural *hukou* and local/non-local *hukou* differs across programmes. Rural *hukou* is a larger constraint than non-local *hukou* in health insurance enrolment which includes urban employee and resident health insurance.

City fiscal revenue has positive and significant effects on enrolment in social health insurance and basic pension schemes (i.e. Models 1 and 2). Thus, intergovernmental fiscal system which defines local fiscal capacity is another critical *institutional constraint*. These results suggest that the labour force of the informal sector in a city with large fiscal capacity is likely to enrol in social programmes. Social security and employment expenditure is negatively associated with the enrolment rate of pension and social health insurance but is insignificant.

--- Table 4 approximately here ---

Determinants of Programme Enrolment: Self-selection

The results reveal the *self-selection* behaviour in programme enrolment. Employers often have discretionary power to decide their programme enrolment. They are likely to self-select to enrol in programmes. Table 4 shows that employers in the informal sector are more likely to opt out of social insurance programmes than employees do (i.e. Models 1, 2 and 3). However, employers are more likely to purchase private commercial pension and health insurance (i.e. Models 4 and 5). The results suggest that the benefits of social insurance programmes may not be attractive to employers in the informal sector. Rather, employers will opt for private commercial programmes.

Income is positively and statistically significant in Model 3. The income effect is positive in 'other' insurance reported in Model 3 because the amount of

contribution for employees is not income related for maternity and injury insurance (see Table 1). In this case, high-income workers may be more likely to afford to enrol in 'other insurance' than low-income workers may. By contrast, income is statistically insignificant in Model 1 and only marginally significant in Model 2. For basic employee pension and health insurance, the contribution is income-related particularly for employees. High-income workers may lack a strong incentive to enrol because they need to contribute substantially.

Determinants of Programme Enrolment: Interaction between Institutional Constraints and Self-selection

The self-selection behaviour of employers in the informal sector is constrained by institutions, such as *hukou*. Table 5 shows the effects of institutional constraints on employers in the informal sector. Compared with the informal sector employers with urban/local *hukou*, employers with rural/non-local *hukou* in the informal sector are less likely to enrol in pension and health insurance programmes (i.e. Models 1 and 2 in Table 5). The findings suggest that the degree of self-selection is affected by the *hukou* constraints. Employers with rural or non-local *hukou* in the informal sector are likely to opt out of social programmes because the benefits of these programmes are often non-transferable across cities or from urban to rural areas. Accordingly, the institutional constraints from *hukou* magnify this self-selection effect. Fiscal revenue remains to be a significant determinant of programme enrolment in the analysis in Table 5, thereby suggesting that governments with strong fiscal capacity may be able to provide good social benefits that are attractive to employers in the informal sector.

Table 5 shows that the coefficient of income is insignificant. That is, no significant difference is obtained in enrolment decision amongst employers with different income levels. High-income employers may want to enrol with the urban resident pension and health insurance, in which the amount of contribution is not income-related. In this case, the income effect is insignificant because the resident and basic employee insurances are considered social insurance in the current research. Amongst the employers in the data sample, 138 are enrolled with urban resident health insurance, whereas only 71 are enrolled with basic urban employee health insurance.

--- Table 5 approximately here ---

Discussion and Conclusion

This research comprehensively analyses the participation of the urban informal sector labour force in all social insurance programmes after the proactive expansion of social protection in the past decade in China. This study uses the nationally representative household survey and city-level statistics as bases to reveal that the labour force of the informal sector remains significantly disadvantaged in social insurance participation, and the social protection in urban China remains has yet to become universal.

This research empirically proves that institutional constraints, self-selection behaviour and their interactive effects are the main determinants for the undercoverage of social protection of the informal sector labour force in urban China. The effects of self-selection and institutional constraints of *hukou* on social insurance can be supported by a recent report from official media. Migrant workers who are mainly subject to the institutional constraint of *hukou* are more likely to ‘voluntarily’ undercontribute to social insurance programmes than other urban labour forces.⁸

The labour force of the informal sector is subject to certain institutional constraints (e.g. *hukou* status and intergovernmental fiscal system) that determine the fiscal capacity of the city of residence. Workers who have urban and local *hukou* and reside in a city with large fiscal capacity are likely to enrol in social insurances. Urban and local *hukou* statuses remain significant determinants of social insurance enrolment in urban China, even within the informal sector, where the occupation-based welfare system is at its weakest. The findings on institutional constraints suggest that the resource distribution function of the *hukou* system prevails.

Self-selection behaviour is another significant determinant of social insurance enrolment. Employers of the urban informal sector have more substantial discretionary power than employees in deciding on their enrolment in social insurance programmes. Compared to employees, these employers are more unlikely to enrol in social insurance. Instead, they are more likely to enrol in private commercial insurance programmes compared to employees.

In addition, the self-selection behaviour varies based on the *hukou* status. Employers without urban/local *hukou* are more likely to opt out of social programmes than those with urban/local *hukou*. That is, the former may expect that the benefit levels of social insurance programmes are limited for people without urban/local *hukou*. Self-selection in the income dimension may not be completely ruled out, although the enrolment status of employers does not vary significantly with income level. High-income employers in the informal sector are likely to opt out of the basic employee insurance and instead enrol with the urban resident social insurance, under which the amount of contributions is fixed and not income related.

The results are substantially consistent across the pension and health insurance programmes which are two key social insurance programmes with similar contribution and benefit structure. By contrast, the results are slightly different for the ‘other’ insurance (i.e. unemployment, work injury and maternity). First, the effect of institutional constraints is not as strong for ‘other’ insurance as that for pension and health insurance programmes. A substantially smaller amount of government subsidy has been allocated to ‘other’ insurance compared to the cases of pension or health insurance. For example, the government subsidy for ‘other’ insurances in 2013 merely amounted to approximately 0.3% and 0.4% of the subsidy for pension and health insurance respectively⁹. In this case, local fiscal capacity is much less relevant for ‘other’ insurance than pension/health insurance. Second, the self-selection effect is higher for ‘other’ social insurances than pension and health insurance programmes. The differences could be due to the different regulatory requirements of the insurance enrolment. The Social Insurance Law states that the insurances of unemployment, work injury and maternity (these three insurances are defined as ‘other insurance’ in this study) are only compulsory for workers with written labour contract.

This research is embedded in a broad literature that discusses the institutional constraints to social protection, including labour market structure and policy regulation. The research contribution to the literature is threefold. First, this research pioneers in presenting the degree of and reason for the under-enrolment in social insurance of the labour force in the urban informal sector. Although social protection becomes further inclusive, integrated, generous and progressive in certain administrative jurisdictions (Shi, 2012; Gao et al., 2013), the current research shows

that the divisions of social insurance in regions and *hukou* status remain persistent and nationwide.

Second, this research contributes to the literature on the political and economic dynamics of the current programme design (Wong et al., 2007; Huang, 2014, 2015; Liu et al., 2015). Moreover, the current study provides micro-level evidence of the self-selection behaviour of employers in the informal sector who opt out of the social programmes because of insufficient benefit level. These findings in China are not unique. Similar self-selection behaviour had been observed in other developing countries, such as Latin American countries (Berens, 2015).

Third, the present research reveals that the undercoverage of social insurance programmes for the informal sector labour force is a result of the interplay between institutional constraints and selection behaviour. This finding contributes in understanding the effect of the interplay of enrolment eligibility rules, benefit levels and individual conditions on the participation in social insurance. For example, this research implies that the interaction between self-selection and *hukou* status can explain why the social insurance enrolment rate of urban migrants is higher than that of rural migrants. By contrast, Cheng et al. (2014) emphasised on the role of human resource management of performance reward and labour retention. The present research also provides a concrete case of the interaction between actors and institutions in social policy (UNRISD, 2012; Lowndes and Roberts, 2013). Another concern on self-selection in programme enrolment is that people may opt to enter the informal sector or migrate to a particular city with high benefits from social insurance before they consider opting out of social insurance programmes. For example, an increasing number of skilled workers opt to work in the informal sector in developed regions to enjoy high wages, considerable autonomy and dignity (Huang, 2012). With these additional selections on locations and sectors, the real magnitude of the self-selection effect on programme enrolment may be even larger than the current estimation.

The findings on the effects of *hukou* and local fiscal capacity on the universal coverage of the informal sector labour force imply that the fragmented social insurance regimes in China have significant effects on the urban–rural and spatial fragmentations based on the *hukou* system and territorial inequality of economic

development, respectively (Shi, 2012; Ngok, 2016). These findings also suggest that institutional constraints, such as the fragmentation of governance (e.g. *hukou* in China) and intergovernmental fiscal system (e.g. the fiscal capacity of a city), are generally crucial to achieve a universal coverage of social programmes in developing countries.

Notes

- ¹ For example, people under informal employment in Guangzhou could join one of the health insurance programmes for urban workers or residents (*Southern Metropolis Daily*, June 9, 2015).
- ² Unemployment insurance balance amounted to RMB 300 billion (Shiye baoxian jieyu sanqianyi at <http://news.sina.com.cn/newobserv/sybx/>, accessed on July 20, 2016).
- ³ The central government provided RMB 20 billion out of RMB 46.9 billion as subsidy for urban resident health insurance according to http://sbs.mof.gov.cn/zhengwuxinxi/gongzuodongtai/201302/t20130228_739589.html, accessed on March 27, 2017.
- ⁴ *Budget Report 2015*, Ministry of Finance at <http://yss.mof.gov.cn/2015czys/>, accessed on July 20, 2016.
- ⁵ See the official webpage of the database at <http://css.sysu.edu.cn/Data>. The data set has been extensively applied to investigate the social and economic conditions of the labour force in China (e.g. Xie and Zhou, 2014; Zhang, et al., 2015).
- ⁶ See the official webpage of the database at <https://www.ceicdata.com/en/countries/china>.
- ⁷ Workers under informal employment but working in the formal sector enterprises are considered as formal sector workers in statistical yearbooks. See the definition of ‘Employed Staff and Workers’ in the *China Statistical Yearbook 2016*, <http://www.stats.gov.cn/tjsj/ndsj/2016/html/zbe04.htm>, accessed on March 16, 2017.
- ⁸ A report by the Hainan provincial government, Social Security Bureau has similar observations, November 18, 2016, <http://www.hi.si.gov.cn/sbxwzxsbxw/20161118/20632.html>, accessed on November 30, 2016.
- ⁹ In 2013, the government subsidy for pension and health insurance reached RMB 408.3 and 308.2 billion, respectively. For the other three social insurances, the total government subsidy was merely RMB 1.3 billion. See http://sbs.mof.gov.cn/zhengwuxinxi/gongzuodongtai/201305/t20130507_858298.html, accessed on March 26, 2017.

Table 1 Rates of contributions to social insurance programmes in urban China, 2012

Programme	Contribution		Whether the benefit is proportional to contribution
	Employer (payroll)	Employee (monthly wage)	
<i>Insurance programmes for employees</i>			
Basic pension	≤ 20%	≤ 8%	✓
Basic health	6%	2%	✗ ¹
Unemployment ²	2%	1%	✗
Work injury	1%	0	✗
Maternity	≤ 1%	0	✗
Total	≤ 30%	≤ 13%	
<i>Insurance programmes for residents³</i>			
	Resident		
Pension	Annual lump sum		✗ ⁴
Health	Annual lump sum		✗

Sources: Adapted from Giles, et al., 2013.

Note:

1. The benefit of social pooling account is not contribution related. But reimbursement from individual account is contribution related.
2. Since 2015, the contribution rate of unemployment insurance for employers has decreased from 3% to 2%. See http://news.xinhuanet.com/fortune/2015-03/04/c_1114523421.htm, accessed July 21, 2016.
3. Both the contributions and benefits of resident insurance programmes are in a lump sum decided by local government.
4. Only those residents making a 15-years of contribution are entitled to claim pension benefit.

Table 2 Enrolment rates of different groups in social insurance programmes (in percentage)

Urban Labour Force (<i>N</i> =3,160)	Pension Programme	Health Programme	Other Types of Social Insurance
Formal sector workers (<i>N</i> = 1,093)	90.29	94.84	77.73
Informal sector workers (<i>N</i> = 2,067)	46.66	57.71	28.13
Employers (<i>N</i> = 531)	33.60	41.22	6.81
Employees (<i>N</i> = 1,536)	51.66	64.03	36.30

Note: Sampling weights from CLDS 2012 are applied on the enrolment rates.

Table 3 Disadvantages of informal sector in programme enrolment, mixed-effects logistic regression models, random effects clustered at city levels

	Pension Programme (1)	Health Programme (2)	Other Social Insurances (3)
Informal sector (yes = 1)	-1.633*** (0.126)	-1.916*** (0.172)	-1.820*** (0.103)
<i>Individual-level Characteristics</i>			
Rural <i>hukou</i> (yes = 1)	-1.387*** (0.131)	-1.812*** (0.139)	-0.640*** (0.138)
Non-local <i>hukou</i> (yes = 1)	-0.696*** (0.138)	-0.605*** (0.151)	-0.381** (0.139)
Income	0.023*** (0.006)	0.038*** (0.007)	0.067*** (0.007)
Education (years of schooling)	0.086*** (0.016)	0.167*** (0.018)	0.069*** (0.015)
Age	0.036*** (0.005)	0.034*** (0.006)	-0.023*** (0.005)
Gender (female = 1)	0.217* (0.097)	0.058 (0.111)	-0.260** (0.091)
<i>City-level Characteristics in 2011</i>			
Fiscal revenue	0.108 (0.071)	0.163* (0.076)	0.048 (0.060)
Social security and employment expenditure	-0.370 (0.363)	-0.552 (0.379)	-0.254 (0.310)
Health expenditure	0.048 (0.576)	0.773 (0.599)	0.947+ (0.494)
GDP per capita	0.012 (0.009)	0.001 (0.009)	0.012 (0.008)
Intercept	-1.077* (0.510)	-0.777 (0.558)	-0.044 (0.457)
Random Effects Intercept	-0.474*** (0.143)	-0.471** (0.153)	-0.674*** (0.152)
Wald chi-square statistics (df)	603.48*** (11)	638.21*** (11)	630.92*** (11)
Likelihood ratio tests: comparison to one-level model	74.95***	52.01***	53.57***
Observations: 3,160 cases in individual level, 57 groups in city level			

Note: The city-level characteristics in 2011 (i.e. GDP per capita, fiscal revenue, social security and employment expenditure, and (government) health expenditure) are determined per capita and in RMB 1,000. Income was transformed by adding 0.001 and taken the logarithm because the original variable includes zero with a skewness of 3.8. “Other types of social insurance” include work injury, maternity, and unemployment insurance programmes. Standard errors are in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table 4 Determinants of programme enrolment for informal sector workers, mixed-effects logistic regression models, random effects clustered at city levels

	Social Insurance Programme			Private Commercial Insurance Programme	
	Pension (1)	Health (2)	Other types (3)	Pension (4)	Health (5)
<i>Institutional Constraints</i>					
Rural <i>hukou</i> (yes = 1)	-1.323*** (0.146)	-1.638*** (0.149)	-0.579*** (0.162)	-0.630* (0.269)	-0.342 (0.216)
Non-local <i>hukou</i> (yes = 1)	-0.739*** (0.155)	-0.548*** (0.161)	-0.423** (0.162)	-0.082 (0.252)	-0.232 (0.211)
Fiscal revenue of a city in 2011	0.162* (0.070)	0.163* (0.079)	0.066 (0.067)	0.236* (0.103)	0.104 (0.086)
<i>Self-selection Behaviour</i>					
Employer (yes = 1)	-0.353* (0.172)	-0.412* (0.179)	-1.263*** (0.206)	0.790** (0.269)	0.704** (0.223)
<i>Individual-level Controls</i>					
Income	0.010 (0.009)	0.018+ (0.009)	0.035*** (0.010)	-0.026+ (0.014)	-0.018 (0.012)
Education (years of schooling)	0.098*** (0.018)	0.154*** (0.020)	0.101*** (0.019)	0.051 (0.032)	0.088*** (0.026)
Age	0.035*** (0.006)	0.030*** (0.007)	-0.018** (0.006)	-0.018+ (0.011)	-0.008 (0.009)
Gender (female = 1)	0.249* (0.111)	0.068 (0.120)	-0.261* (0.111)	0.154 (0.186)	0.103 (0.150)
Formal sector experience (yes = 1)	0.359** (0.126)	0.732*** (0.139)	0.018 (0.130)	0.235 (0.215)	0.183 (0.175)
<i>City-level Control in 2011</i>					
Social security and employment expenditure	-0.542 (0.351)	-0.645 (0.393)	-0.531 (0.347)	-0.038 (0.535)	0.404 (0.464)
Health expenditure	0.262 (0.550)	0.920 (0.617)	0.980+ (0.537)	-0.777 (0.965)	0.114 (0.724)
GDP per capita	0.007 (0.009)	0.002 (0.010)	0.010 (0.009)	-0.018 (0.013)	-0.007 (0.011)
Intercept	-2.789*** (0.533)	-2.590*** (0.579)	-1.885*** (0.535)	-2.768** (0.881)	-3.665*** (0.736)
Random Effects					
Intercept	-0.593*** (0.162)	-0.460** (0.158)	-0.620*** (0.176)	-0.436+ (0.248)	-0.446* (0.211)
Wald chi-square statistics (df)	357.54*** (12)	439.66*** (12)	223.65*** (12)	52.39*** (12)	59.93*** (12)
Likelihood ratio tests: comparison to one-level model	45.34***	45.99***	35.04***	13.71***	24.31***

Observations: 2,067 cases in individual level, 57 groups in city level

Note: Refer to Table 3 of the main text for notes of GDP per capita, fiscal revenue, social security and employment expenditure, health expenditure, income, and other types of social insurance. Standard errors are in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table 5 Determinants of programme enrolments for employers, mixed-effects logistic regression models, random effects clustered at city levels

	Pension Programme	Health Programme	Other Types of Social Insurance
	(1)	(2)	(3)
<i>Institutional Constraints</i>			
Rural <i>hukou</i> (yes = 1)	-1.191*** (0.272)	-1.560*** (0.282)	0.633 (0.500)
Non-local <i>hukou</i> (yes = 1)	-0.776** (0.299)	-0.547+ (0.308)	-1.647** (0.557)
Fiscal revenue of a city in 2011	0.244* (0.105)	0.301* (0.136)	0.034 (0.140)
<i>Individual-level Controls</i>			
Income	-0.021 (0.014)	-0.002 (0.014)	0.031 (0.020)
Education (years of schooling)	0.102** (0.039)	0.114** (0.040)	0.221** (0.073)
Age	0.057*** (0.014)	0.043** (0.014)	0.006 (0.020)
Gender (female = 1)	0.541* (0.235)	0.573* (0.240)	-0.165 (0.379)
Formal sector experience (yes = 1)	0.891*** (0.270)	0.643* (0.285)	0.833* (0.414)
<i>City-level Control in 2011</i>			
Social security and employment expenditure	-0.766 (0.564)	-0.230 (0.698)	1.184 (0.780)
Health expenditure	0.849 (0.852)	0.281 (1.110)	1.318 (1.044)
GDP per capita	0.000 (0.012)	-0.011 (0.016)	0.013 (0.016)
Intercept	-4.761*** (0.994)	-3.462** (1.073)	-7.590*** (1.680)
Random Effects			
Intercept	-0.780 (0.478)	-0.091 (0.243)	-0.568 (0.603)
Wald chi-square statistics (df)	100.77*** (11)	94.26*** (11)	43.28*** (11)
Likelihood ratio tests: comparison to one-level model	1.92+	14.43***	1.17

Observations: 531 cases in individual level, 54 groups in city level

Note: Refer to Table 3 of the main text for notes on GDP per capita, fiscal revenue, social security and employment expenditure, health expenditure, income, and other types of social insurance. Standard errors are in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

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