

# The Dynamics of Social Assistance in the Informal Economy: Empirical Evidence from Urban China

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## Abstract

This article contributes to the growing body of research on social assistance (SA) dynamics by analyzing patterns of SA receipt in China, a middle-income country with a large informal employment sector. Using national low-income household survey data and event history analysis, this study explored the mechanisms underlying exit from Dibao (formally known as Minimum Living Security) and changes in exit probability over time. We found that in the context of an informal economy, the ‘explicit’ change of individual characteristics and employment structure decisively affects receipt duration on the micro and macroeconomic levels, respectively. On the policy level, affected by the informal employment structure, employment services tend to be of low quality and fail to promote Dibao exit effectively. Although the specific Dibao payment strategy, which is used to address the difficulty in means tests, largely curbs the risks of declining working motivation, it considerably increases the possibility of prolonged Dibao use. With this systemic influence of informal employment, a unique pattern of SA receipt characterized by the combination of long-term use and a nondecreasing hazard rate has developed in China.

**Keywords:** social assistance dynamics; informal economy; event history analysis; Dibao; urban China

## Introduction

As an integral part of the social security system, social assistance (SA) functions as an important policy instrument in providing a safety net for poverty-stricken households. In recent years, facing escalating demands for SA, concern over welfare dependence has been growing internationally (Achdut and Stier, 2020; Bergmark and Bäckman, 2004; Saraceno, 2002). The phenomenon of long-term receipt of assistance has fueled worries that prolonged assistance may lead to negative consequences in terms of moral hazard and social problems (Dahl and Lorentzen, 2003; Leisering and Leibfried, 1999). Meanwhile, discussions of remedies to move long-term recipients from assistance to self-sufficiency have increased considerably.

The growing research interest in long-term receipt of SA is related to not only policy concerns, but also growth in longitudinal data sources. During the past few decades, substantial empirical longitudinal studies have studied the receipt of SA in Western developed countries from dynamic perspectives – such as how beneficiaries exit (Ayala and Rodríguez, 2007; Leisering and Leibfried, 1999; Leisering and Walker, 1998; Saraceno, 2002; Taylor, 1999) and then reenter SA (Bergmark and Bäckman, 2004), how time spent on welfare influences dependence (Cooke, 2009; Dahl and Lorentzen, 2003; Hansen, 2009), and so forth.

We have relatively little insight, however, into the dynamics of SA in developing countries. China is a case in point. As a middle-income country with a SA system that aims to provide benefits at a subsistence level and a vibrant economy with a large informal employment sector, China is an interesting case for investigating the dynamics of SA. Until now, however, no previous studies have adopted quantitative longitudinal methods to analyze Dibao receipt over time. We cannot get accurate information on the duration of Dibao assistance, nor can we derive in-depth knowledge from existing studies regarding how people leave Dibao.

To fill this knowledge gap, this study used event history analysis and nationally representative data to provide empirical evidence on Dibao dynamics. The key issues we sought to address include: Does informal employment affect the pattern of Dibao use, and if so, how? In the context of an informal economy, do the mechanisms behind Dibao exit and changes in exit probability exhibit certain peculiarities, compared with empirical evidence from formal economies? Findings from this research may have important implications for the development of Dibao and similar SA programs in middle-income countries.

The remainder of the article is organized as follows. The next section provides additional background information on the Dibao program and informal economy in China. The third section reviews previous research on the dynamics of SA. The fourth section introduces our dataset and methodology.

The main findings are presented in the fifth section. The sixth section provides a discussion of the findings. We draw conclusions in the final section.

### **Dibao and informal economy in China**

Confronted with ‘new urban poverty’ caused by socioeconomic transformation, the Chinese government started to reform its traditional residual SA program in the 1990s. In 1999, the State Council formally issued the Regulation on Assuring Urban Residents’ Minimum Standard of Living to implement Dibao. Since then, all poverty-stricken people, including not only traditional recipients known as the ‘three nos,’<sup>1</sup> but also low-income, able-bodied, unemployed individuals, have been entitled to Dibao benefits. Between 1999 and 2014, with the increase in central government transfers, the recipient population has rapidly climbed from 2.7 million to 18.8 million. Meanwhile, the national average Dibao level rose from 147 yuan to 373 yuan. Of note, although the absolute level of Dibao has increased, Dibao payment has clearly been insufficient in relative terms (Kongshøj, 2017). Between 1999 and 2014, the ratio of the Dibao level to average per capita disposable income only averaged 18.6% (Ministry of Civil Affairs, various years).

With the marketization of the economy, the employment structure of China has undergone a dramatic transformation. Under planning, informal employment had a minimal existence because most urban laborers were employed by state-owned or collective enterprises and enjoyed lifetime job security. Since the economic reform, however, the rise of a dynamic but relatively unregulated private sector, the restructuring of state-owned enterprises that led to massive layoffs, and the unprecedented rural-to-urban migration all have driven rapid expansion of the informal economy (Huang, 2009). In 1978, only 0.16% of urban workers were employed outside the formal sector. By 1985 and 1995, that figure had increased to 3.5% and 19.7%, respectively (Hu and Zhao, 2006). Around 2000, at the height of layoff phenomenon (*xiagang*, 下岗), the share of informal employment in the total urban workforce hit 65.2% (Gao, 2015). Thereafter, owing to the expansion of social insurance coverage and strengthening of labor market regulations, the proportion of informal employment has declined slowly. Nonetheless, informal employment still represents a high proportion of urban employment (Jiang *et al.*, 2018). In 2005, the proportion of informal employment relative to urban employment ranged from 49.6% (Xue *et al.*, 2014) to 58.6% (Hu and Zhao, 2006). In 2016, the share of informal employment was estimated to range from 33.6% (Chen *et al.*, 2021) to 57.4% (He and Zhou, 2019).<sup>2</sup>

Although the informal economy has boosted employment growth, it has simultaneously posed serious challenges to SA administration. Due to the prevalent hidden employment of Dibao claimants, it is rather difficult for Dibao

agencies to conduct means tests and adjust eligibility according to the recipients' changing conditions. In a nationwide survey, frontline Dibao cadres indicated that 'once Dibao entry occurs, exit would be difficult' and 'inaccurate assessment of income and assets of Dibao households' were the top two difficulties in Dibao administration (Ministry of Civil Affairs, various years).

### Literature review

Previous studies on the dynamics of SA tended to analyze the mechanisms underlying welfare exit from the following three perspectives: characteristics and agency of individual recipients, active measures, and conditions of the macro labor market.

From the micro perspective, many studies have identified individual characteristics as important predictors of the likelihood of welfare exit. More human capital, such as higher educational attainment and better health condition, was consistently found to have a positive impact on the exit rate (Barret, 2000; Taylor, 1999). Younger age predicted shorter duration of SA (Ayala and Rodríguez, 2007). Employment was found to be the most common way to end SA (Blank, 1989; Dahl and Lorentzen, 2003). Given these identified effects of individual factors, we assumed that some would also apply to exit from Dibao. For example, more education and better health could also be expected to increase the Dibao exit rate. However, given the informal employment environment in China, we expected that employment would have different effects relative to Western findings. As some research suggested, Dibao beneficiaries often take odd jobs that are hard to track (Guo *et al.*, 2017), and Dibao exit rarely takes place through employment (Gao, 2009). Rather, receipt of Dibao usually terminates when certain demographic changes such as reaching retirement age, children's reaching adulthood or graduation, and death occur (Wong *et al.*, 2014). This led us to propose the following hypothesis:

**H1.** Demographic events play a more crucial role than employment event in predicting Dibao exit.

At the micro level, another important question that has received attention involves duration dependence; that is, whether time spent receiving benefits negatively affects individual agency and likelihood of exit. Some evidence has shown that the likelihood of exiting SA is declining over time (Bane and Ellwood, 1994; Murray, 1984). This is sometimes referred to as the welfare trap – a decreasing probability of exit due to degradation of self-efficacy as time in welfare passes (Cooke, 2009). Regarding time's effect on Dibao dependence, we expected that the working mobility of Dibao beneficiaries would not be negatively affected by the duration of receipt due to the payment structure of Dibao. Confronted with hidden employment and difficulty in means tests, Dibao

agencies have widely used ‘assumed income,’ which supposes that able-bodied applicants have an income at the minimum wage or locally defined level rather than what they actually earn. In practice, the Dibao allowance usually functions as living support for a child alone in a poor household (Wong *et al.*, 2014). Accordingly, the likelihood of weakening motivation would be rather low. Thus, the following hypothesis was proposed:

**H2.** Dibao beneficiaries’ motivation to work and likelihood of exiting does not decline over time.

At the policy level, the impact of active measures on employment and welfare exit have been extensively discussed. It has been noted that a drift toward ‘work-first’ workfare schemes, a feature of which is compelling welfare recipients into employment immediately, regardless of job quality, has occurred in neoliberal countries (Daguerre, 2008; Handler, 2003; Karger, 2003). In contrast, in social democratic countries, workfare schemes give high priority to long-term skill accumulation, with the goal of helping welfare recipients gain employment in the primary labor market (Dostal, 2008; Torfing, 1999).<sup>3</sup>

The labor market structure has been identified as an important factor that led to this divergence in workfare orientations. For example, Peck and Theodore (2000) contended that the attractiveness of the work-first approach to neoliberal regimes could be functionally explained by the ‘fit’ of work-first programs with the segmented, flexible labor market. Based on the principle of work compulsion, work-first programs produce a continuously ‘forced’ labor supply for the bottom-level labor market (Daguerre, 2008; Karger, 2003). In this sense, a work-first program can be seen as a social policy complement to the aggressive orthodoxy of neoliberal labor market policy and laissez-faire macroeconomic management. Compared with neoliberal countries, where the secondary market functions as an important sector for maintaining the flexibility and vitality of the national economy, social democratic countries lack the competitive advantage in low-wage, low-skill employment (Torfing, 1999). The labor market structure of the latter features low skill dispersion and a high degree of wage equality. Accordingly, social democratic countries have pursued the ‘human capital development approach,’ which aims to promote mainstream employment and reduce labor market segmentation (Dostal, 2008). Regarding the effects of these two workfare strategies, the mainstream view holds that compared with work-focused programs, training-focused programs tend to perform better in promoting employment and welfare exit in the long run (Dengler, 2019).

In China, training services, which are representative of the human capital approach, and job referral services, which are consistent with the goals of a work-first approach, have both been notionally introduced in Dibao policies. In practice, however, job referral services have not been strictly implemented

by Dibao departments as the policy requires (Lin, 2012). Meanwhile, training services were widely found to be ineffective for upgrading skills due to the rather limited training duration and content (Gao, 2009).

This overall underdevelopment of employment services should be viewed in the context of the informal employment structure and Dibao payment arrangements. As noted, since the reform, an apparent trend of informalization has occurred in China. Informal employment has not only become the main engine of employment growth (Hu and Zhao, 2006; Xue *et al.*, 2014),<sup>4</sup> but also has been regarded as beneficial for maintaining China's low labor cost advantage in the global competition for capital (Chen *et al.*, 2021). In this context, informality has been embraced, whereas the high-cost human capital approach that would facilitate formal employment has been overlooked. From the perspective of labor market structure, the Chinese workfare scheme would more likely move toward a work-first approach than a human capital approach, considering the former's advantage in inserting welfare recipients into secondary employment rapidly. Of note is that because Dibao benefits payment has long been set at an extremely limited level (Wang *et al.*, 2021), Dibao recipients have kept strong working motivation and presented high acceptance of employment, even precarious jobs in the secondary labor market. Hence, the development of work-first programs is not assumed to be imperative either.<sup>5</sup> The following hypothesis was proposed:

**H3.** The effects of active measures including both job referral and training services in moving Dibao beneficiaries from welfare to work are limited.

From the macro perspective, scholars have noted the effect of labor market conditions on the duration of SA. Existing research tended to use the unemployment rate as a proxy of labor market performance, and the conclusions drawn so far have been fairly similar; that is, the exit rate could be negatively affected by the unemployment rate (Bergmark and Bäckman, 2004; Dahl and Lorentzen, 2003; Taylor, 1999).

Although the literature has examined macro labor market determinants, the predominant focus on the effect of general employment rather than employment structure did not address the research question we raise in this paper: Does an informal employment structure affect the duration of receipt? In fact, the negative impact of the informal economy on SA administration, the effectiveness of which is based on means testing, has been noted (Hutton and Redmond, 2000). Statistics provided by OECD (2004) demonstrated that countries in which the informal economy was less than 5% of GDP seemed able to administer SA effectively, with means testing based on declared incomes; countries with informal economy shares between 5% and 10% of GDP established national schemes but faced difficulties in administration; and countries with informal economy shares greater than 10% of GDP rarely implemented a

national minimum income scheme. However, until now, no studies have directly addressed the informal economy's effect on the exit rate.

As a middle-income country that has undergone a phenomenal transformation in its employment structure, China is an interesting case for investigating this question. In the late 1990s, due to the acceleration of rural-to-urban migration and the intensification of layoff arrangements, the Chinese informal economy saw the most prominent expansion in the reform era. In 1999, 2000, and 2001, the informal economy production's share of GDP hit 31.9%, 33.5%, and 34.0%, respectively (Wong and Jing, 2010), which was an extremely high rate relative to the findings of OECD (2004). Since 2002, especially after 2008,<sup>6</sup> the scale of the informal economy has declined. From 2002 to 2007, the informal economy's share of GDP gradually decreased from 27.3% to 13% (Wong and Jing, 2010). From 2008 to 2013, the average share of the informal economy in GDP per annum was estimated to be around 12.04% (Chen, 2020). The informal economy's overall contraction from 1999 to 2013 can also be reflected approximately by the decline of the share of informal employment relative to total employment. In 2000, the proportion of informal employment to total urban workforce was 65.2% (Gao, 2015). Then, this figure dropped to 49.6% in 2005, 40.3% in 2010 (Xue *et al.*, 2014), and finally reached 36.2% in 2013 (Chen *et al.*, 2021). To test the influence of the evolution of this employment structure on Dibao dynamics, the following hypothesis was proposed:

**H4.** Time spent in Dibao is structurally affected by the scale of the informal economy.

Based on the above hypotheses, the theoretical model of this study was constructed as follows (Figure 1).

## Data and method

### Data

The data used in this study came from the 2013 Chinese Poor Households Support System Survey (CPHS), conducted by China's Ministry of Civil Affairs. CPHS suited the analytic needs of this study because it contains abundant retrospective information on SA experiences, such as reasons for applying for Dibao, time spent in the assistance program, number of exits, participation in employment programs, and so forth. The CPHS recruited a sample of 4,709 households that had Dibao experiences between 1999 and 2013 in 10 provinces, including current and previous Dibao households, based on a multistage stratified sampling method. Given the purpose of this study to explore patterns of receiving SA among able-bodied recipients, we omitted households whose head of household was beyond working age, disabled, or a

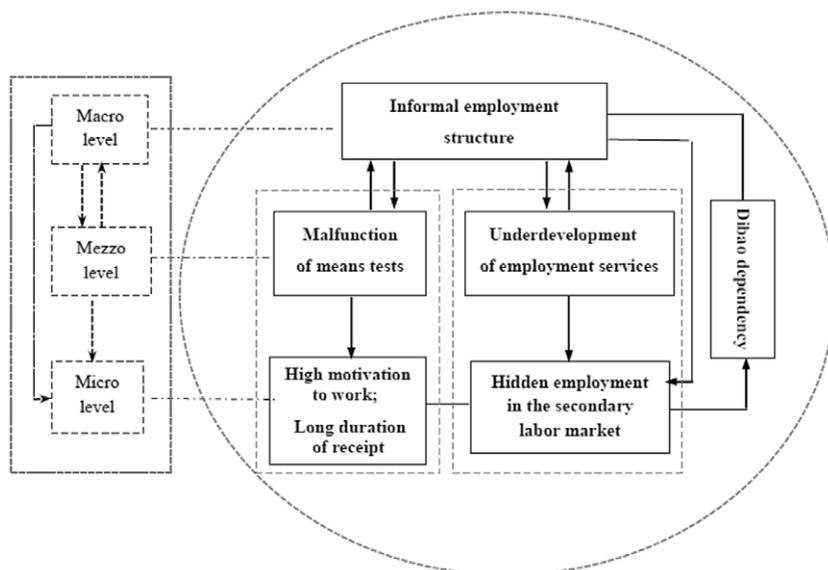


FIGURE 1. Multidimensional analysis model regarding SA dynamics in China.

student. This yielded a sample of 2,573 household heads, which was the analytic sample of our study.

### Variables

The dependent variable was duration of Dibao receipt. Independent variables were measured as follows. Age at entry into Dibao was measured as younger than 35, 35–40, 41–45, 46–50, and 51–60 years old. Gender was noted as female or male. Health status was measured as poor, average, or good. Employment status and family difficulties (including heavy caregiving burden, high medical expenses, and so forth) were combined to capture all possible family maintenance statuses: employed without other family difficulties, employed with other family difficulties, unemployed without other family difficulties, and unemployed with other family difficulties. Education was measured as primary school or below, middle school, high school, and college or beyond. Political status was noted as membership in the Chinese Communist Party compared to no such membership. The youngest child's age at entry into Dibao was distinguished as younger than 6, 6–15, 16–18, 19–22 (college age), or older than 22. Due to the lack of official records on the recipients' participation in employment programs, participation in job referral and training programs was based on self-reporting in CPHS and measured as binary dummy variables in our research. Regional CPI and unemployment rates were included to determine the potential effects of macroeconomic conditions. Based on the measurement of the informal economy in the literature section, we categorized

the respondents according to when their Dibao entry occurred using the entry cohorts of 1999–2001, 2002–2007, and 2008–2013 to test our hypothesis regarding the informal employment structure's impact on Dibao dynamics.

### Choice of statistical model

Hazards can be estimated by parametric models and semiparametric models. Parametric models rest on rather strong theoretical assumptions regarding the functional form of the hazard rate. Despite this restrictiveness, if tests confirm that the chosen distribution is suitable for the data used, then a parametric model may prove an efficient option with hazard functions being completely specified. Semiparametric models do not assume a specific distribution for the hazard function, and this flexibility has led them to become the most common structures in the analyses of SA dynamics (Ayala and Rodríguez, 2007). Note that whereas the semiparametric approach is flexible, it is unable to test hypotheses regarding the shape of the hazard function. Besides, this flexibility comes at the cost of efficiency in parameter estimation (Cooke, 2009). Given the respective advantages and shortcomings of parametric and semiparametric models, a common practice in hazard estimation is to use both approaches to enhance credibility. In this study, we applied both types of models to identify factors that affected Dibao exit. We chose a parametric model with a Weibull distribution. Additionally, to test the reliability of the estimated results of the Weibull model, a semiparametric Cox model was also calculated.

### Results

In this section, we provide descriptive statistics for the sample (Table 1) and present the results for the duration of SA (Figure 2). We then demonstrate the nonparametric smoothed hazard estimates, results of Weibull (parametric) models, and results of Cox PH (semiparametric) models. Last, we present estimates for the likelihood of exiting Dibao over time by describing the shape of the hazard function.

### Length of SA

Figure 2 demonstrates the frequency distribution of time spent receiving Dibao. The distribution of ongoing spells shows that more than 70% lasted more than 3 years. Previous recipients who exited the program tended to have shorter spells than those who were still receiving Dibao benefits. Nevertheless, almost 60% of previous recipients spent more than 3 years in the program, also suggesting an obvious pattern of prolonged receipt. For all recipients, the proportion of long-term claims and very long-term claims was 21.42% and 47.96%, respectively.<sup>7</sup> Results indicate a high risk of long-term receipt among Dibao beneficiaries.

TABLE 1. Descriptive statistics.

Variable	Label	Mean	SD	Min	Max
headage1	Age 35-40	0.281	0.449	0	1
headage2	Age 41-45	0.237	0.425	0	1
headage3	Age 46-50	0.149	0.356	0	1
headage4	Age 51-60	0.093	0.290	0	1
gender	Gender	0.607	0.488	0	1
health1	Average health	0.414	0.492	0	1
health2	Good health	0.209	0.407	0	1
empdif	Employed + other difficulties	0.413	0.492	0	1
unempdif	Unemployed + other difficulties	0.293	0.455	0	1
emp	Employed	0.097	0.296	0	1
edu1	Middle school	0.513	0.499	0	1
edu2	High school	0.303	0.460	0	1
edu3	College or beyond	0.055	0.228	0	1
CCP	Political status	0.061	0.240	0	1
childage1	Child's age 6-15	0.416	0.493	0	1
childage2	Child's age 16-18	0.109	0.312	0	1
childage3	Child's age 19-22	0.117	0.321	0	1
childage4	Child's age >22	0.084	0.278	0	1
ref	Job referral services	0.161	0.368	0	1
train	Training services	0.393	0.488	0	1
cohort1	Cohort 2002-2007	0.505	0.500	0	1
cohort2	Cohort 2008-2013	0.361	0.480	0	1
unemprate	Unemployment rate	3.22	0.582	2.1	4
CPI	CPI	98.57	1.274	97.2	100.4

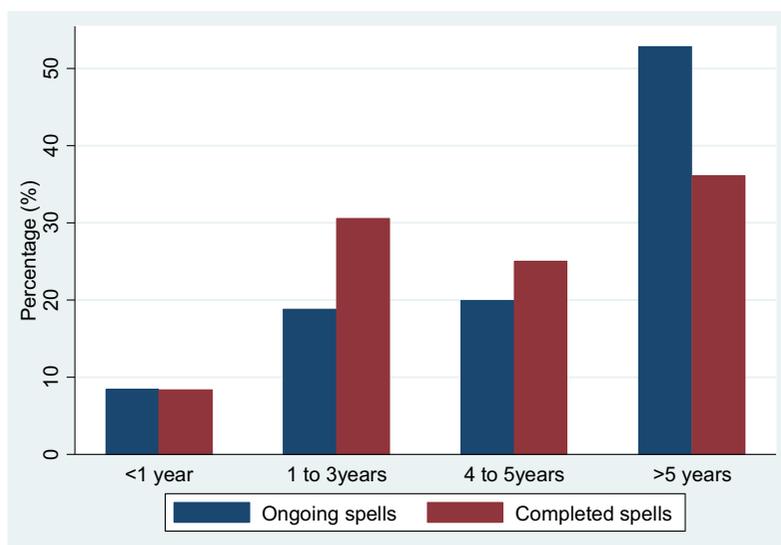


FIGURE 2. Frequency distribution of Dibao spells.

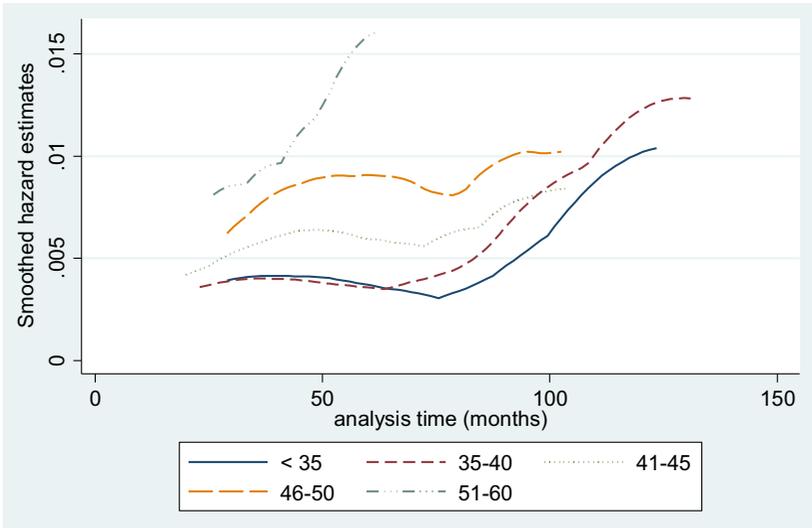


FIGURE 3. Hazard estimates by age.

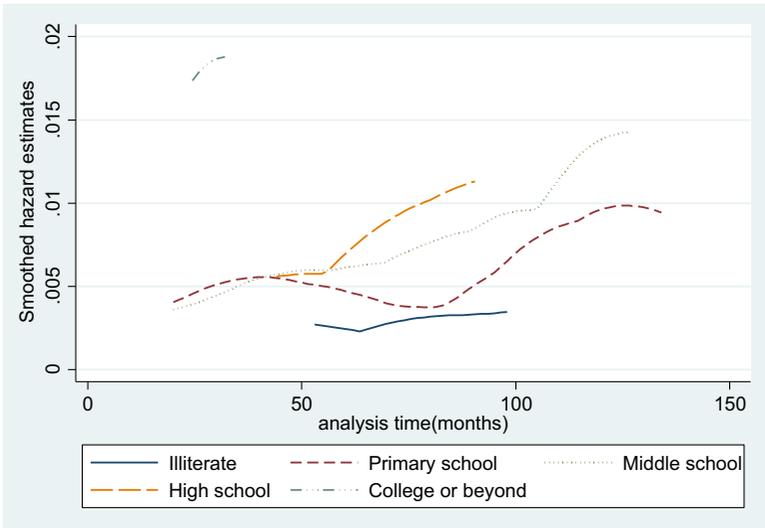


FIGURE 4. Hazard estimates by education.

### Predictors of SA exit

Figure 3 to Figure 7 present the hazard rate curves for Dibao recipients. The hazard functions for different age groups show that the exit rates kept growing as age increased (Figure 3). The likelihood of exiting was generally higher for

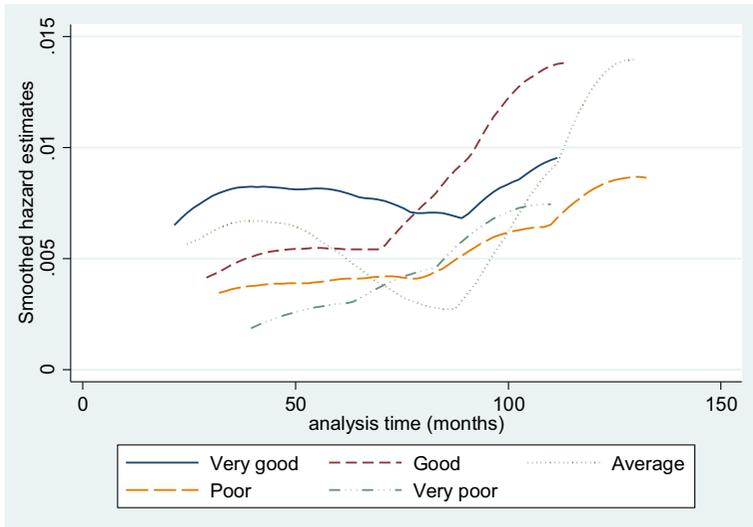


FIGURE 5. Hazard estimates by health status.

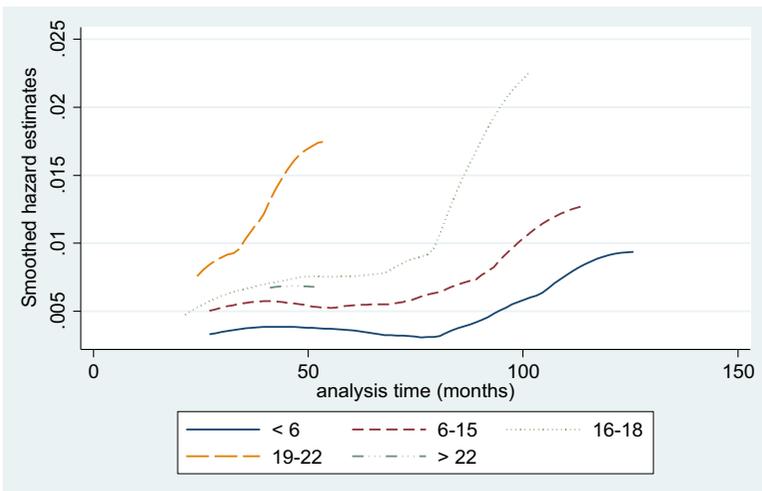


FIGURE 6. Hazard estimates by child's age.

people with more education (Figure 4). The hazard rate for people in good health was greater than that of people in poor health (Figure 5). The exit rate grew consistently by child age until children reached 22 years old (college graduation age); then the exit rate dropped sharply for recipients with children older than 22 (Figure 6). Figure 7 shows that the lowest likelihood of exit occurred among recipients who entered Dibao between 1999 and 2001. The

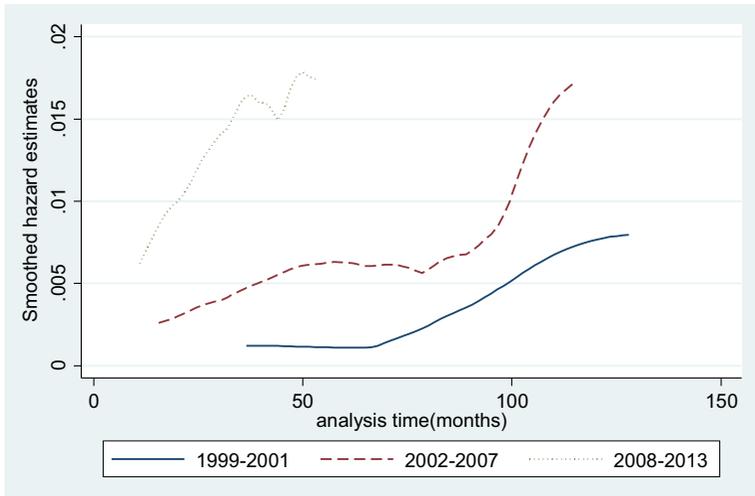


FIGURE 7. Hazard estimates by entry cohort.

2002–2007 entry cohort had a higher likelihood of exit than the 1999–2001 entry cohort. The likelihood of exit was highest for recipients in the 2008–2013 cohort.

### Model results

The results of Weibull models of time spent receiving Dibao is presented in Table 2 (Model 1 to 3). As expected, groups with better health conditions and higher education tended to leave Dibao faster. Gender and political status had no significant effect on the exit rate.

Controlling for other variables, age significantly increased the probability of exit. This result markedly contrasts with previous studies (Ayala and Rodríguez, 2007; Bergmark and Bäckman, 2004), in which age was found to exert a negative effect on the exit rate. Normally, the probability of exit might be expected to decrease as age increases, because younger people are more likely to find opportunities in the labor market. For Dibao recipients, although being young may imply more employment chances, the jobs they find are usually casual ones that are difficult to check, so the positive impact of younger age on Dibao exit is likely limited. In contrast, reaching retirement age and obtaining a pension is decisive and can be easily observed by Dibao administrators. Therefore, the probability of leaving Dibao is more likely to increase rather than decrease with age.

Compared with unemployed participants, employed respondents did not leave Dibao significantly faster. Although employment status has been widely identified by Western researchers as a decisive predictor of leaving SA (Blank, 1989; Dahl and Lorentzen, 2003), employment might exert few effects on Dibao exit, considering that most employed recipients are engaged in

TABLE 2. Determinants of exits from urban Dibao.

	Weibull models (hazard ratios)			Cox models (hazard ratios)		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Age (ref: < 35 years)						
35-40	1.884** (0.426)	1.835** (0.422)	1.744* (0.401)	1.952** (0.443)	1.902** (0.439)	1.778* (0.409)
41-45	1.730* (0.427)	1.763* (0.441)	1.679* (0.424)	1.799* (0.446)	1.828* (0.459)	1.726* (0.435)
46-50	2.354** (0.632)	2.339** (0.638)	2.188** (0.598)	2.412** (0.649)	2.402** (0.658)	2.214** (0.607)
51-60	2.578** (0.925)	2.622** (0.945)	2.240* (0.813)	2.552** (0.923)	2.597** (0.944)	2.262* (0.828)
Gender (1 = male, 0 = female)	0.687 (0.213)	0.740 (0.232)	0.763 (0.239)	0.697 (0.217)	0.754 (0.236)	0.788 (0.248)
Health status (ref: poor)						
Average	1.132 (0.192)	1.107 (0.190)	1.082 (0.186)	1.162 (0.198)	1.134 (0.195)	1.097 (0.189)
Good	1.483* (0.269)	1.457* (0.267)	1.407+ (0.259)	1.554* (0.284)	1.526* (0.280)	1.449* (0.267)
Maintenance status (ref: unemployed)						
Unemployed + other difficulties	0.651* (0.130)	0.651* (0.132)	0.686+ (0.139)	0.642* (0.129)	0.641* (0.131)	0.692+ (0.141)
Employed	1.365 (0.270)	1.363 (0.274)	1.297 (0.261)	1.355 (0.269)	1.355 (0.274)	1.279 (0.259)
Employed + other difficulties	1.052 (0.281)	1.054 (0.287)	0.976 (0.267)	1.047 (0.280)	1.050 (0.287)	0.974 (0.266)
Education (ref: primary school or below)						
Middle school	1.075 (0.222)	1.048 (0.218)	0.998 (0.207)	1.072 (0.221)	1.047 (0.218)	1.010 (0.210)
High school	1.667* (0.348)	1.662* (0.349)	1.634* (0.343)	1.660* (0.347)	1.654* (0.348)	1.639* (0.345)

TABLE 2. Continued

	Weibull models (hazard ratios)			Cox models (hazard ratios)		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
College or beyond	4.869* (3.001)	4.126* (3.325)	4.557* (3.459)	4.743* (2.924)	4.509* (2.715)	4.508* (3.417)
Political status (1 = CCP, 0 = Non-CCP)	1.118 (0.204)	1.147 (0.212)	1.168 (0.216)	1.130 (0.207)	1.156 (0.214)	1.170 (0.217)
Child's age (ref: < 6 years)						
6–15	1.732** (0.298)	1.666** (0.291)	1.657** (0.291)	1.831*** (0.318)	1.761** (0.311)	1.753** (0.311)
16–18	2.073** (0.460)	2.112*** (0.469)	1.959** (0.444)	2.206*** (0.495)	2.245*** (0.505)	2.111** (0.483)
19–22	2.947*** (0.771)	2.817*** (0.745)	2.557*** (0.682)	3.077*** (0.812)	2.944*** (0.785)	2.703*** (0.726)
> 22	2.243* (0.872)	1.931 (0.778)	1.848 (0.741)	2.367* (0.929)	2.030 <sup>+</sup> (0.825)	1.923 (0.780)
Job referral services (1 = recipients, 0 = nonrecipients)		0.922 (0.172)	0.928 (0.174)		0.918 (0.172)	0.929 (0.174)
Training services (1 = recipients, 0 = nonrecipients)		0.918 (0.130)	0.908 (0.130)		0.916 (0.130)	0.892 (0.128)
Entry cohort (ref: 1999–2001)						
2002–2007			1.571* (0.271)			1.922** (0.428)
2008–2013			2.855*** (0.715)			3.385*** (0.935)
Unemployment rate			0.577 (0.195)			0.590 (0.199)
CPI			1.055 (0.087)			1.047 (0.086)
Constant	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)			
N	2065	1992	1992	2065	1992	1992

Notes: Standard errors in parentheses. <sup>+</sup> $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

informal employment that is hard for Dibao agencies to detect. Hypothesis 1 was supported.

Child age was significantly associated with the exit rate. The hazard rate was highest for recipients with children between 19 and 22 years old and second highest for those with children between 16 and 18. Dibao recipients whose children were older than 22 did not have a higher likelihood of exiting than the reference group. Hypothesis 1 was further supported. As mentioned, confronted with hidden employment, Dibao agencies flexibly use 'assumed income' and provide Dibao benefits only for the children of recipients. Thereby, changes in children's age and education would decisively influence the likelihood of Dibao exit.

Both job referral and training programs had no significant effects on exit rate. Hypothesis 3 was supported. This result mirrors previous findings, which showed that the effects of employment services for Dibao recipients were limited (Gao, 2009; Lin, 2012).

Unemployment rate had no significant effect on the length of receipt, which is at odds with findings indicating the important effect of unemployment rate on welfare exit (Hansen, 2009; Taylor, 1999). In contrast, the entry cohort variable, which reflected the evolution of the informal employment structure, was found to predict exit from Dibao. The hazard of leaving Dibao for the 2002–2007 entry cohort and 2008–2013 entry cohort was 57.1% and 185.5% higher, respectively, relative to the 1999–2001 entry cohort (Model 3), indicating that shrinking informal employment exerted a positive effect on Dibao exit. Hypothesis 4 was supported.

These findings suggest that the duration of receipt may not be best regarded as a simple consequence of aggregate labor market demand and that employment structure may be more important than employment level in terms of affecting the probability of exit. Theoretically, there is reason to think that a declining unemployment rate or increasing employment level, which imply stronger labor market demand, might lead to shorter SA spells. In China, however, even though the general employment level has been increasing during economic reforms – considering that its growth has been primarily stimulated by informal employment (Xue *et al.*, 2014), which has a relatively small effect on Dibao exit as previously discussed – a change in total employment level or the unemployment rate is unlikely to exert a significant effect on leaving Dibao.

The results of Cox models (Model 4 to 6) were fairly similar to those in the Weibull models. Appendix 1 presents the results of tests of the proportional-hazards assumption. All PH values were larger than .05, suggesting that the proportional-hazards assumption was not violated.

### **Shape of hazard function: Changing likelihood of exit over time**

To address our major interest in how Dibao exit depends on time, we examined the hazard rates from the Weibull regression model and Cox regression

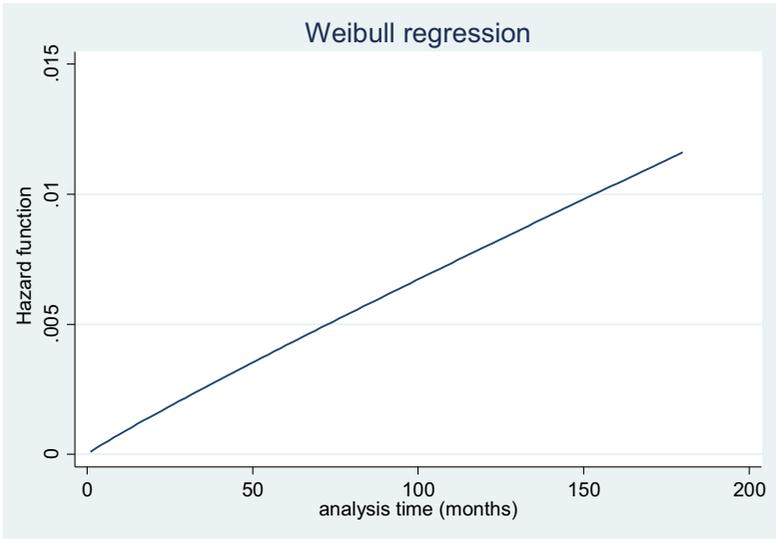


FIGURE 8. Hazard rate plot for Weibull regression model at the mean of all covariates.

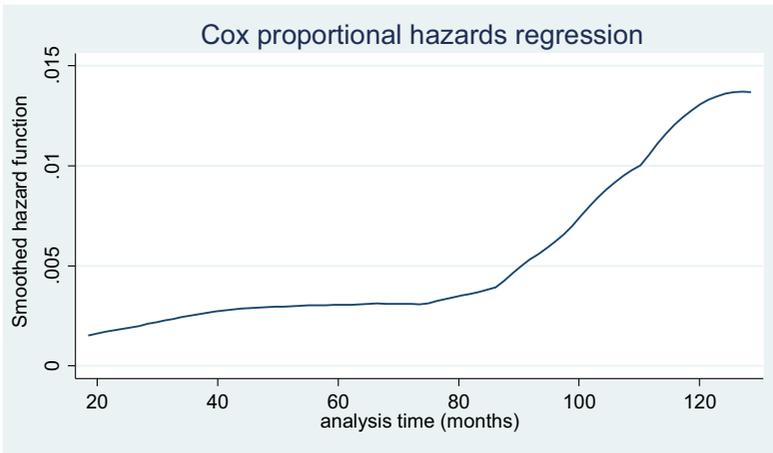


FIGURE 9. Hazard rate plot for Cox PH model at the mean of all covariates.

model. Both hazards were calculated after fixing the values of all other independent variables at their means. As Figure 8 and Figure 9 show, there was no negative time dependence as hypothesized by time dependence theory. On the contrary, the hazard rate steeply increased, indicating that the conditional probability of leaving Dibao increased with the duration of receipt. Hypothesis 2 was supported.

## Discussion

The dynamics of SA is a widely debated issue among social welfare researchers, especially in the West. Until now, however, hardly any quantitative empirical research with a dynamic perspective on patterns of SA receipt in China had been conducted. To fill this research gap, this study used nationally representative data and event history analysis to explore time spent on Dibao and mechanisms underlying Dibao exit.

We found that the median duration of a Dibao spell was 7 years, which suggests that long-term receipt is widespread in the Chinese Dibao scheme. Of note, although prolonged Dibao use was common, no trace of a declining exit rate was detected. We argue that this pattern of receipt – that is, the combination of long-term receipt and a nondecreasing hazard rate – is closely related to the informal employment structure of China. On one hand, confronted with means-testing difficulties posed by hidden employment, Dibao agencies employed an alternative payment method, providing Dibao benefits as an allowance for a child, which changed the regular payment structure of SA in terms of a top-up benefit payment based on a means test. This payment approach largely reduced the risk of decreased working motivation but considerably increased the possibility of long-term receipt. On the other hand, under an informal employment structure, human capital-oriented employment services tend to be overlooked. Due to the lack of the necessary skills to realize formal employment, Dibao recipients are trapped in a persistent, mixed use of resources from hidden employment and limited benefit support.

This study's theoretical contributions to research regarding SA dynamics can be summarized as follows.

At the micro level, we empirically tested the time dependence hypothesis and proved that there was no negative duration dependence when the benefit payment was not strictly based on a means test. According to the time dependence hypothesis, the likelihood of welfare exit will decline over time, because prolonged receipt may lead to the decay of skills (Dahl and Lorentzen, 2003), erosion of self-confidence (Leisering and Leibfried, 1999), or decline in self-sufficiency (Murray, 1984). Opposed to empirical evidence indicating that negative duration dependence does exist (Cooke, 2009; Hansen, 2009), our research found no declining exit rate over time. We argue that this trend is closely related to the payment structure of Dibao. As noted, to deal with means-testing difficulties, a compromised income assessment strategy in terms of 'assumed income' has been used by local Dibao agencies. By using assumed income, the benefit payment is restricted to a rather limited amount. Additionally, the actual income achieved from informal jobs is disregarded, which means an increase in informal income would not cause a corresponding reduction of benefits. Because the tradeoff between working income and benefits no longer exists, the theoretical 'poverty trap' (OECD, 1999) caused by a high benefit

withdrawal rate doesn't occur. Consequently, Dibao claimants' working motivation tends not to decline with time.

At the policy level, we add evidence from the Chinese context to the emerging theoretical viewpoints regarding the influence of labor market structure on workfare. Since Peck and Theodore (2000) proposed the 'labor-regulatory' functions of workfare programs, the dialectical relationship between workfare and the labor market has been noted by analysts. More research has attempted to explain workfare orientations, especially the striking divergence of workfare approaches between neoliberal and social democratic regimes, from the angle of the labor market structure (Dostal, 2008; Karger, 2003; Torfing, 1999). This labor market structure perspective is also helpful for understanding the orientation and effects of employment services in China. Since the reform, the segmentation of Chinese labor market has increased with informality (Xue *et al.*, 2014). The informal economy has been considered an effective way to boost economic growth at a relatively low labor cost and was highly embraced by the Chinese government. Accordingly, the high-cost human capital approach geared toward long-term skill accumulation and formal employment has been de-emphasized.

A notable question is why job referral services, or a work-first approach, which in theory would be more likely to be deployed by Chinese government due to its advantage in stimulating secondary employment, achieved no substantive development. When we considered this in the overarching context of the SA system, we found that as a matter of fact, a lower-cost strategy has been adopted by Chinese government to achieve the goal of work first – that is, to restrict the Dibao payment to an extremely limited amount so that recipients would be stimulated to enter the bottom-level labor market. Whereas this approach effectively curbed work disincentive, it obviously was not an active policy arrangement. Due to the lack of the necessary qualifications to enter formal employment, Dibao beneficiaries were trapped in precarious, contingent jobs, which in turn, reinforced the hidden nature of employment and made exiting more difficult.

At the macro level, we extended the observation dimension from employment level to employment structure, proving that the latter plays a more important role than the former in affecting the duration of receipt in an informal economy. Although the impact of the macro economy on welfare duration has been widely tested in Western research (Bergmark and Bäckman, 2004; Dahl and Lorentzen, 2003; Taylor, 1999), theoretical considerations were confined to the impact of unemployment rate, and the impact of employment structure has long been neglected. Therefore, we reconstructed a macro dependence model by considering the effects of both employment level and employment structure and empirically found that in an informal economy, the exit rate will be more sensitive to changes in the employment structure than changes in the employment level.

If we define the macroeconomic factors leading to long-term dependence as a 'structural deficit,' then for China, the alleviation of a structural deficit would be more complicated. In formal economies, the sensitivity of exit rate to unemployment rate means that the improvement of labor market conditions, or the growth of labor demand, would effectively promote welfare exit. In contrast, in the informal economy, the exit rate's rise cannot merely rely on the growth of the employment level. If the future employment growth of China is still dominated by informal employment, the hidden employment of Dibao recipients and long-term dependence on Dibao will persist. In line with employment growth, the employment structure has to be adjusted by promoting the transformation from informal employment to formal employment so that the structural deficit and Dibao dependence can be fundamentally alleviated.

### Conclusion

To summarize, by taking China as a case, this study constructed a multifaceted analysis model regarding SA dynamics in the context of an informal economy. We found that under the systemic influence of an informal employment structure, both the mechanisms underpinning welfare exit and the exit probability's changes over time demonstrated certain peculiarities. Concerning exit mechanisms, compared with formal economies, wherein employment status and employment level have been proved to be crucial factors determining welfare duration on the individual and macroeconomic levels (Bergmark and Bäckman, 2004; Blank, 1989; Taylor, 1999), in the informal economy of China, the explicit change of demographic characteristics and employment structure have become powerful predictors of leaving SA. On the policy level, affected by the informal employment structure, employment services tend to have low quality and cannot effectively promote Dibao exit. Regarding the variation of exit probability over time, affected by the Dibao payment approach that was developed to tackle the difficulty in means tests, Dibao exit demonstrates a nondecreasing hazard rate over time. Time dependence theory, which posits the likelihood of exit would decline over time (Cooke, 2009; Dahl and Lorentzen, 2003; Hansen, 2009), is not supported in China.

The main policy implications provided by this research are as follows. First, given the great influence of the informal economy on Dibao dynamics, the formalization of the employment structure would be of critical significance for the promotion of exit from long-term receipt. Crucial steps toward formality should involve more job creation in the formal sector, expansion of social insurance coverage for informal employees, and stronger enforcement of labor inspections. Meanwhile, at the social assistance policy level, more high-quality activation programs should be developed to promote the recipients' formal employment. Constrained by the extremely limited financial input, employment

assistance for Dibao recipients has long been underdeveloped. More human capital-oriented employment services should be initiated with stronger financial support, so that welfare recipients can be freed from low-productivity activities, obtain formal jobs, and finally break the persistent equilibrium created by the mix of inadequate benefit support and resources from the informal labor market.

Despite these implications, the current research has several limitations that may guide future research on this topic. First, types of unemployment were not recorded in CPHS, so we couldn't distinguish between people who were unemployed or laid off. It's different from unemployment when people are laid off: they retain a labor relationship with their former working units, which in turn have a legal obligation to them regarding social insurance payments. Future studies should distinguish between unemployment and layoff and empirically test whether any difference in SA trajectories exists between these two groups. Besides, the evaluation period in this study was from 1999 to 2013. In 2014, the State Council issued its 'Temporary Regulation on Social Assistance,' which legally included more diverse reemployment measures in the Dibao system. Whether these measures effectively promote Dibao exit is an important question for future research.

### **Acknowledgements**

The study is supported by the National Social Science Foundation project of China [Grant No. 21BSH145].

### **Competing interest declarations**

The author(s) declare no competing interests.

### **Notes**

- 1 The 'three nos' refer to people with no family support, no ability to work, and no source of income, primarily childless older adults, people with severe disabilities, and orphans.
- 2 The discrepancy in statistical results is related to different definitions of informal employment. Generally, estimates of informal employment in China follow two distinct approaches. One approach defines informal employment by the characteristics of the enterprise, e.g. the estimates made by Huang (2009), Hu and Zhao (2006), and He and Zhou (2019), which counted employment in 'formal enterprises' including state-owned units, collective units, and other ownership units as formal employment and employment in private enterprises, self-employment, and other unregistered employment as informal employment. Considering that there are also temporary workers in 'formal working units' and many employees in private enterprises have obtained stable labor relations in China, some researchers attempted another approach, which defines informal employment by the characteristics of the job, to raise the accuracy of estimates. For example, following the guideline of the International Labour Office (2003), Gao (2015), Xue *et al.* (2014), and

- Chen *et al.* (2021) applied criteria such as labor contracts, social insurance, and registration to measure informality.
- 3 According to the dual labor market theory, the labor market is divided into 'primary' and 'secondary' markets (Doeringer and Piore, 1971). Jobs in the primary market possess characteristics such as high wages, good working conditions, and employment stability. Jobs in the secondary market tend to have low wages, fringe benefits, poor working conditions, and high labor turnover.
  - 4 Between 1990 and 2016, among the 2.44 billion newly created urban jobs, a high of 85.25% (2.08 billion) was created by the informal employment sector; the job opportunities provided by formal sector only accounted for 14.75%, or 0.36 billion (He and Zhou, 2019).
  - 5 An association between the level of SA and the stringency of work tests was also found in the research of Eardley *et al.* (1996), which showed a tendency for countries paying high SA benefits to have tough working requirements. In contrast, in countries paying low benefits, labor participation arrangements tend to be weak.
  - 6 Since 2008, labor market regulations, such as the Labor Contract Law, the Employment Promotion Law, and the Labor Disputes Mediation Law, have been issued, which led to an increase in the percentage of workers with labor contracts (Xue *et al.*, 2014).
  - 7 Leisering and Leibfried (1999) defined SA receipt of less than 1 year as a short-term claim, 1 to 3 years as a medium-term claim, 3 to 5 years as a long-term claim, and more than 5 years as a very long-term claim.

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## Appendix 1. Test of proportional-hazards assumption

Variable	rho	chiz	df	Prob > chiz
headage1	0.101	2.52	1	0.112
headage2	0.099	2.54	1	0.110
headage3	0.071	1.34	1	0.247
headage4	0.001	0.00	1	0.994
gender	-0.019	0.08	1	0.771
health1	-0.054	0.66	1	0.415
health2	0.007	0.01	1	0.906
unempdif	-0.046	0.50	1	0.479
emp	-0.038	0.37	1	0.543
empdif	0.031	0.22	1	0.635
edu1	-0.025	0.16	1	0.691
edu2	-0.024	0.15	1	0.700
edu3	0.074	1.29	1	0.256
CCP	0.035	0.29	1	0.589
childage1	0.079	1.58	1	0.208
childage2	0.114	3.40	1	0.065
childage3	0.089	2.10	1	0.147
childage4	0.037	0.35	1	0.555
ref	0.032	0.23	1	0.630
train	0.045	0.51	1	0.476
cohort1	0.011	0.03	1	0.873
cohort2	0.017	0.06	1	0.800
unemprate	-0.013	0.04	1	0.837
CPI	-0.018	0.09	1	0.764
Global test		21.17	24	0.628