Entry, Exit and Transformation——An research on the employment flexibility of the Rural Labor in China (1998-2015)

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Based on nationally representative survey data, this paper investigates the mechanism of employment flexibility of rural labor in China. By analyzing the dynamic adjustment process (the entry and exit of different industries and sectors), we find that the new entering off-farm workers and off-farm workers exiting the non-agricultural industry/sector play a main role in the employment flexibility, rather than the off-farm workers' smoothly transfer among different non-agricultural industries/sectors in the labor market. To explain the difficulty of rural laborers' employment transformation, we establish the empirical model for multiple regression analysis and the estimation shows that the relative lack of human capital is still the main factor.

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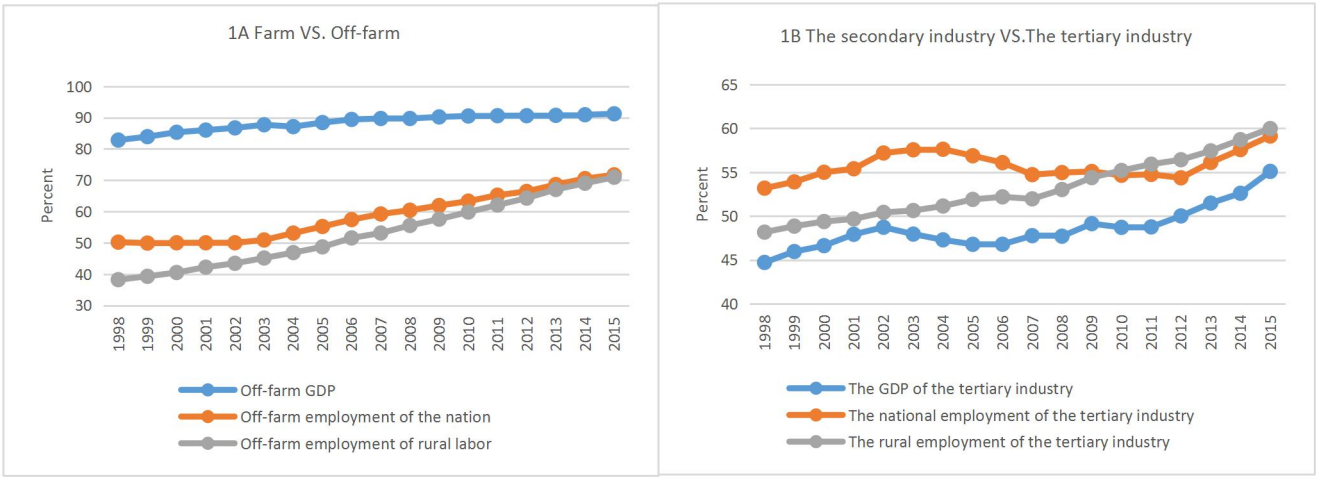
Keywords: Rural labor market; Employment flexibility; Entry and exit; Employment transformation

1. Introduction

Over the past four decades, China has experienced rapid economic growth. One of the most striking phenomenon is the large scale and continued rural labor transition. Hundreds of millions of rural labor shifted from rural to urban have access to off-farm employment. In Figure 1A, we can clearly observe this rapid and steady trend. With the transformation and upgrading of the economic structure, the tertiary industry gradually replaced the main position of the secondary industry. What's more, we can even find that the speed of rural labor to follow this development trend is far faster than the urban labor (Figure 1B). Numerous related researches[1] (Gu Haibing, 1997; Zhang Linxiu et al., 1998; DeBraw et al., 2002; Wu Jiangwu, 2009; li et al., 2013) also found that the employment adjustment of rural labor is more flexible and effective[2].



Source:Author's survey

Figure 1. The economic transformation;national employment;rural employment[3]

On the other hand, the dual economic structure has existed in China for a long time and the discrimination and barriers to rural labor in the labor market are well known (Meng Xin, 2005). The off-farm rural employment is mainly distributed in the following six sectors: manufacturing industry, construction industry, wholesale and retail, residents services/repairs and other services, scientific research and technical services, leasing and business services (Figure 2)[4]. In addition to the manufacturing and construction industries, there is little overlap between the employment of rural and urban labor (Zhang Tonglong and Zhang Linxiu, 2017). It's surprising to see the flexible rural labor market under such an institutional environment. How can the rural labor seemingly sightless flowing conform to the adjustment of industrial structure?

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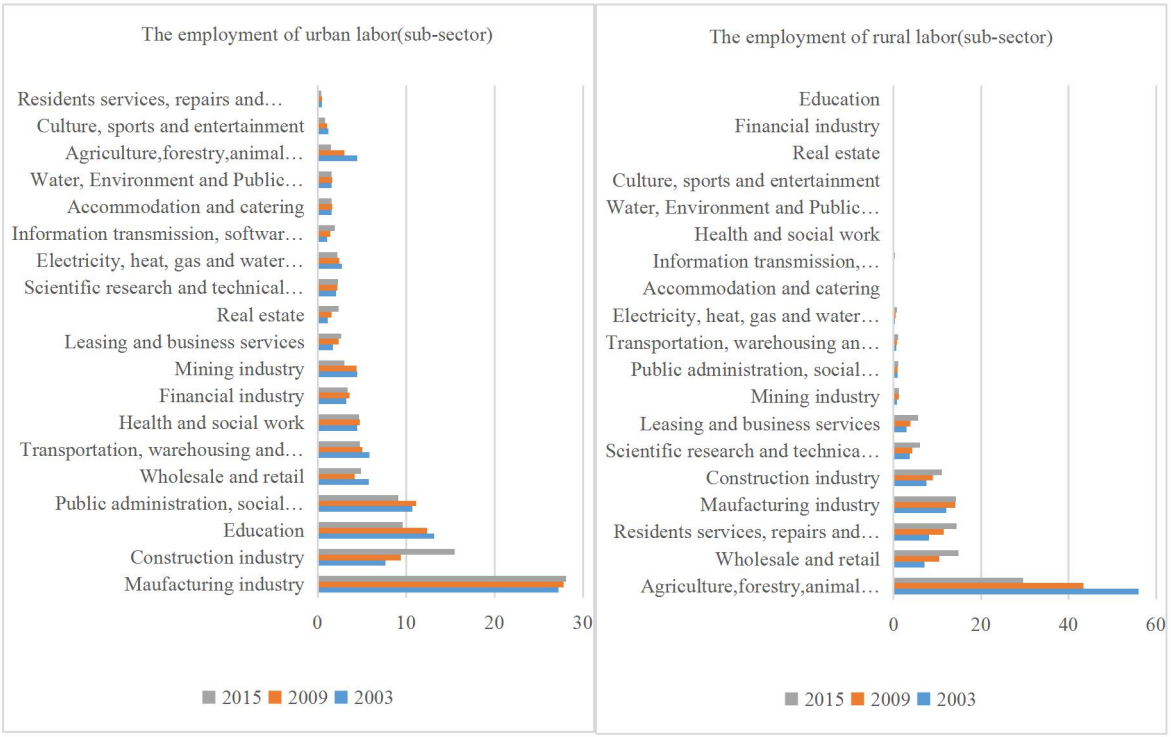
[1] In the previous study, Gu Haibing (1997) estimated the degree of labor marketization in China at early stage. Zhang Linxiu et al. (1998) first used the household survey data to find evidences that the rural labor market was gradually forming. De Brauw et al. (2002) further study the evolution trend of the rural labor market and find that its good operation is conducive to the labor force mobility. Even Li Yabo (2003) estimates the degree of marketization of rural labor force, and thinks that the degree of marktetization has reached a relatively mature level; Cai Fang (2007), Wu (2009),Li, et al (2013), Wang Yake, etc. (2012), Wang Quanxing (2016), Xie Zengyi (2017) also believe that the rural labor market is well developed and the employment flexibility is higher, especially more flexible than the urban labor force.

[2] In comparison with Figure 1, we also use the employment of urban collective units by sectors and the GDP of different sectors from the national statistical yearbook and survey data used in this paper to calculate the Pearson correlation coefficient and significance test between the employment and GDP in the non-agricultural sector. The results show that the distribution of rural labor in the major six industries, except for the manufacturing sector, the other five sectors' correlation coefficient are higher than the town, and they are all significant at 1% level. These evidences also show that the employment of rural labor are more flexible than the town.

[3] In figure 1A, the GDP and overall employment data from the national statistical yearbook, rural labor force employment data for the author survey, later described in detail.The figure 1B uses the same data source, but all the ratios are calculated after the removal of the primary industry, that is, the use of the tertiary industry / (secondary industry + tertiary industry).

[4] The results are sorted by 2015 employment data and the proportion of the labor in the six major sectors is more than 90% on average.

How to understand "the inflexibility behind the flexibility"? Specifically, how does the rural labor adjust flexibly among different industries and even different sectors? What is the mechanism behind it? Which factors will affect the rural laborers' employment transformation?



Source:Author's survey

Figure 2. The distribution of employment in different sectors (urban vs. rural).[5]

Unfortunately, there is no relevant study to answer this series of questions in academia. In our opinion, the lack of high-quality survey data is the key to constrain the research. Firstly, the existing data sets are mostly lacking in the details of labor employment and can not analyze the adjustment process among different sectors. Secondly, the cross-sectional data obtained at a specific point in time can not describe the dynamic process of employment adjustment. Thirdly, surveys from small-scale or local labor markets may also be subject to local special policies or environmental backgrounds, and can not grasp the overall situation of the country. Finally, indirect evidence from macroeconomic data research is likely to miss some of the key features of the rural labor market and lead to the misjudgment.

The overall goal of the paper is to contribute to the ongoing assessment of China's rural labor markets, paying special attention to the employment flexibility in rural China. To assess the mechanism of employment flexibility, we examine the patterns of employment adjustment in different industries and sectors using the employment history of 2,000 households from 1998 to 2015. We also use quantitative analysis to search the factors that affect the rural laborers' employment transformation. We find that behind the statistical employment flexibility, the overall adjustment of employment structure mainly through the entry and exit of non-agricultural sector,

[5] The left figure's data source is the result of the calculation using the National Bureau of Statistics website data, the right figure is the calculation of the household data, the sectors classification standard refers to the National Bureau of Statistics classification (GB / T 4754-2011). In order to reflect the changes of distribution in different sectors, we selected the data for 2003, 2009 and 2015 at intervals of five years.

rather than the smoother employment transformation in the non-agricultural sector. Microscopic data show that it is difficult for rural labor to achieve employment transformation among different industries and sectors. Age, working experience and education level are important factors.

To meet these objectives, the rest of the paper will be organized as follows. In the second section, we introduce the data that are used for the analysis. Section 3 sets up a framework for analysis with the dynamic adjustment process at the industrial level. Section 4 further discusses the employment adjustment of rural labor in the most important six sectors. Section 5 uses multivariate analysis to explain the determinants of employment transformation. The final section concludes.

2.Data

The data for our study were collected from a new round of the household level survey which was conducted in April 2016 using a randomly selected, nationally representative sample of 100 rural villages in 5 provinces (Jiangsu, Sichuan, Shaanxi, Jilin and Hebei)[6]. The first round of the survey was conducted in 2005 and the sample selection process uses a combination of stratified and random sampling. Specifically, after the removal of special areas such as municipality and Tibet, we divided into five regions: the northeastern region (Liaoning, Jilin and Heilongjiang), the eastern coastal developed areas (Jiangsu, Zhejiang, Shandong, Fujian and Guangdong), the northern and central regions (Hebei, Henan, Anhui, Hubei, Hunan and Jiangxi), the Loess Plateau in the northwest (Shanxi, Shanxi, Neimenggu, Ningxia, Gansu, Qinghai and Xinjiang) and the southwest (Sichuan, Guizhou, Yunnan and Guangxi) in accordance with the conditions of agricultural production and economic development. In each region, one province was randomly selected as the sample province, which were Jilin, Jiangsu, Hebei, Shanxi and Sichuan. After selecting the sample province, all the counties (cities) in the provinces should be ranked in descending order according to the size of the per capital industrial output value, and then 5 counties were randomly selected from each province. 25 counties were selected as sample counties. In each sample county, the townships of each county are sorted by per capital industrial output value, and then divided into two groups. Each township is randomly selected as a sample township. According to the method of selecting townships, two villages were selected in each sample town, and 100 villages were selected. In the selected sample village, each village randomly selected 20 households according to the family register, and 2000 households were selected in 100 villages.

In the specific investigation process, we designed three levels of the problem:the village, the family and the individual.At the village level, we interviewed the main village cadres, examined the basic natural geography and economic development of the village, and particularly payed attention to the mobility of the village's overall labor.At the household level, we documented the family structure of households, housing and assets, lands, social security and participation in public services in the

[6] The survey was conducted by the Center for Chinese Agricultural Policy,other four surveys were conducted in 2003, 2005, 2008 and 2012, and the sample frame of all the surveys is the same.

village. At the individual level, we focused on the marriage, fertility, education, health and employment status of everyone in the household. It is divided into two questionnaires for employment, a detailed record of the recent year (2015) employment situation, including the main work and possible secondary work and other associated income and welfare information.Another questionnaire is the main information used in this study. It inquired about the concise employment history of each family member since 1998, including the state of work[7] (whether to work or not, the main job, whether it was farming or not, and whether it had self-employed business), the industry, the workplace and whether to live with their families and a series of specific issues.

3.The Mechanism of Employment Flexibility:at the industrial level

According to the information provided in Figure 1 and 2 above, the rural labor market is more flexible than the town, which means that the rural labor can make corresponding adjustments more quickly in response to changes of the economic structure. Although Figure 1 describes the employment adjustment among different industries with the overall data, we can not observe the dynamic adjustment process[8]. Therefore, we use the micro-individual data to analyze the mobility mechanism of rural labor at the industrial level. The data shows that the labor mobility among different industries is the result of entering and exiting the industry. For one industry, if the entering labor are more than the exiting, the employment of this industry will increase. On the contrary, the employment will be reduced. Thus, the overall data will show the laborers' flow from one industry to another.

Following the above ideas, we discuss the disaggregating labor flow in more detail according to the different employment status of entry and exit. The new entering labor in t years can be divided into two categories: the labor engaged in and not engaged in off-farm employment in t-1 years. The latter are consist of two sections: farmers and those without jobs. Those without jobs include students, the not working and 16-year-old people[9] in t years. Similarly, the exiting labor in t years are composed of the labor engaged in and not engaged in off-farm employment in t+1 years. Those without jobs and farmers constitute the latter one.Those without jobs contain the not working and 65-year-old people in t+1 years.

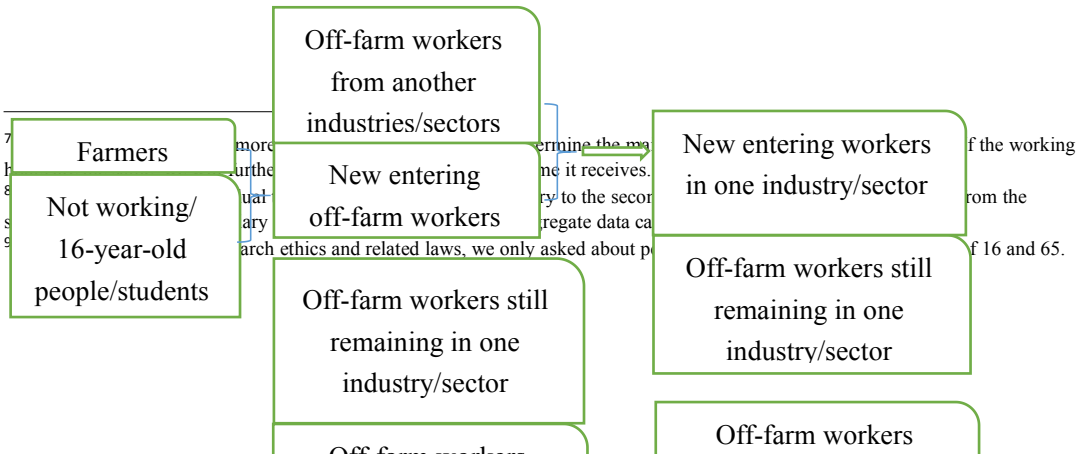
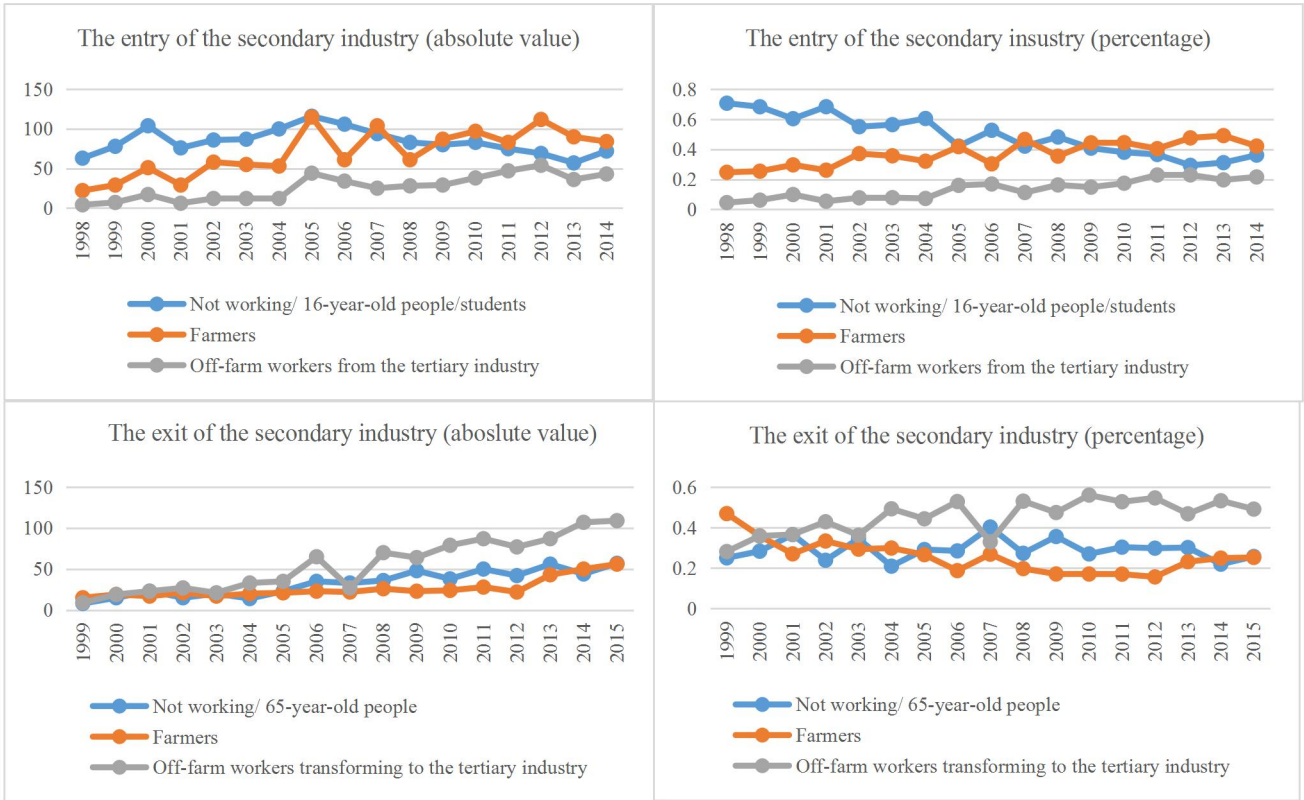


Figure 3. The employment adjustment in different industries/sectors (urban vs. rural).

3.1 The entry and exit of the secondary industry



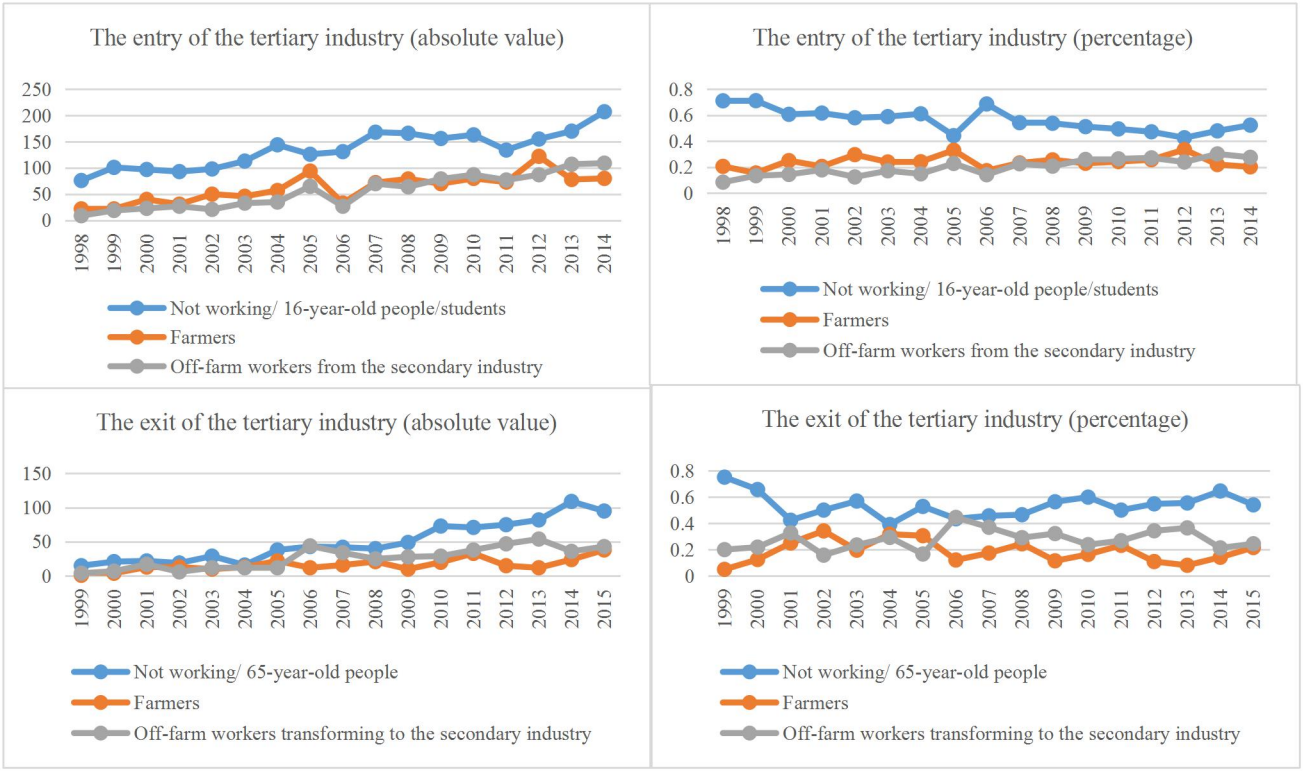
Source:Author's survey

Figure 4. The entry and exit of the secondary industry.

Take the secondary industry for example, we discuss the dynamic adjustment of the rural labor. The data indicate that the proportion of the secondary industry labor in the t-1 years and t+1 years are 94.3% and 95.9% respectively. This evidence demonstrate that on the one hand, the employment of the secondary industry is relatively steady and the entry (5.7%) and exit ratio (4.1%) are not high; the other hand, the job growth is slow. Figure 4 provides the specific entry and exit of the

secondary industry. For the entry, on average, the new entering off-farm workers' absolute value and proportion are 154 and 87% that are the largest part of the labor entering the secondary industry, and most of the new labor are those not working/ 16-year-old and students in t-1 years which account for 49.3%, the farmer followed (37.3%). The proportion of off-farm workers from the tertiary industry (13.4%) is the smallest. In addition, by examining employment trends, we find that the proportion of the new entering off-farm workers reached its peak around 2005, then declined slowly. However, the off-farm workers from the tertiary industry expended steadily between 1998 and 2015. For the exit, on average, most of the off-farm workers exiting the secondary industry (54.6%) choose to exiting the non-agricultural industry, farmers and those not working/65-year-old in t+1 years account for 25.5% and 29.1% respectively. What's more, the employment trends indicate that although the quantity of the labor exiting the secondary industry in the early stage is small, the amount has been growing since the year 2006 which is mainly driven by the off-farm workers transforming to the tertiary industry (increased 21 percentage points). Therefore, the employment adjustment of the rural labor in the secondary industry is through the new entry and exit of the non-agricultural industry, rather than the interaction between the secondary industry and the tertiary industry that the labor in the secondary industry directly transform to the tertiary industry[10].

3.2 The entry and exit of the tertiary industry



Source:Author's survey

Figure 5. The entry and exit of the tertiary industry.

In the same way, we analyze the dynamic adjustment in the tertiary industry. In general, the proportion of the tertiary industry labor in the t-1 years and t+1 years are

[10] Of course, from the trend point of view, the ratio of the employment transformation is getting higher with time.

92.9% and 97.3% respectively which demonstrate the employment in the tertiary industry is also steady and it grow faster than the secondary industry for the reason that the labor entering the tertiary industry (7.1%) are more than the exiting one (2.7%). For the entry, on average, the new entering off-farm workers take up the largest share of the labor entering the tertiary industry, and the absolute value and proportion are 197 and 80% (Figure 5). Specifically, most of the labor are those not working/16-year-old and students in t-1 years (56.1%), farmers followed (23.9%), and the off-farm workers from the secondary industry are the smallest (20%) . This evidence show that the development of the tertiary industry is mainly due to the new entering off-farm workers rather than the absorbed labor from the secondary industry. At the same time it is more attractive for the young labor force than farmers, of course, it may also reflect the strict entry barriers into the tertiary industry. The household data show the three types of labor force all expended during the sample period which display the more and more attraction of the tertiary industry. For the exit, the labor exiting the tertiary industry have always been catalyzed by the off-farm workers exiting the non-agricultural industry (81.2%), most of which are those not working/ 65-year-old people in t+1 years (53.6%), farmers followed (18.7%), and the off-farm workers transforming to the secondary industry are the least (27.6%).The employment trend indicates that the rural labor exiting the tertiary industry began to increase around 2006 and the most rapidly growing ingredient are those not working and 65-year-old. Therefore, the employment adjustment of the rural labor in the tertiary industry also is through the new entry and exit of the non-agricultural industry, rather than the labor in the tertiary industry directly transform to the secondary industry.

In this section, we have provided evidence showing how rural labor are performing in a way consistent with the economic transition. Our descriptive analysis illustrates that the reason for labor force flowing from the secondary industry to the tertiary industry is that the employment of the tertiary industry is more attractive (Figure1,4,5). Specifically, the new entering off-farm workers mainly access to the tertiary industry and the few labor exit the tertiary industry. In this process, the possibility of off-farm workers in the tertiary industry directly transforming to the secondary industry is quite low. Although the labor market seems to be flexible, the individual mobility through employment transformation is still very difficult.

4. The Mechanism of Employment Flexibility:at the sector level

The discuss about the employment adjustment of the rural labor at the industry level only reflect the labor flowing among different industries and can not reveal the detail employment adjustment in one industry, which may underestimate the percentage of employment transformation. For example, the individual who may change his job several times doesn't make adjustment according to the above analysis. Therefore, the research only at the industry level may not be enough to capture employment changes of the rural labor, and the mechanism of the employment adjustment may also inaccurate[11]. It is necessary for us to continue to explore the

[11] A work (job) is a more detailed unit of decomposition and the work is determined by the sector and occupation cross (Qu Xiaobo,

mechanism in this part by further examining the employment adjustment of the rural labor force at the sector level.

We classified the employment of rural labor into 19 sectors according to the standards of the National Bureau of Statistics[12]. The study of the employment adjustment among different sectors use the similar analysis framework (Figure 3)[13]. Due to the off-farm rural employment is mainly distributed in the six sectors, in order to avoid trivial, our discussion is also concentrated in the six major sectors.

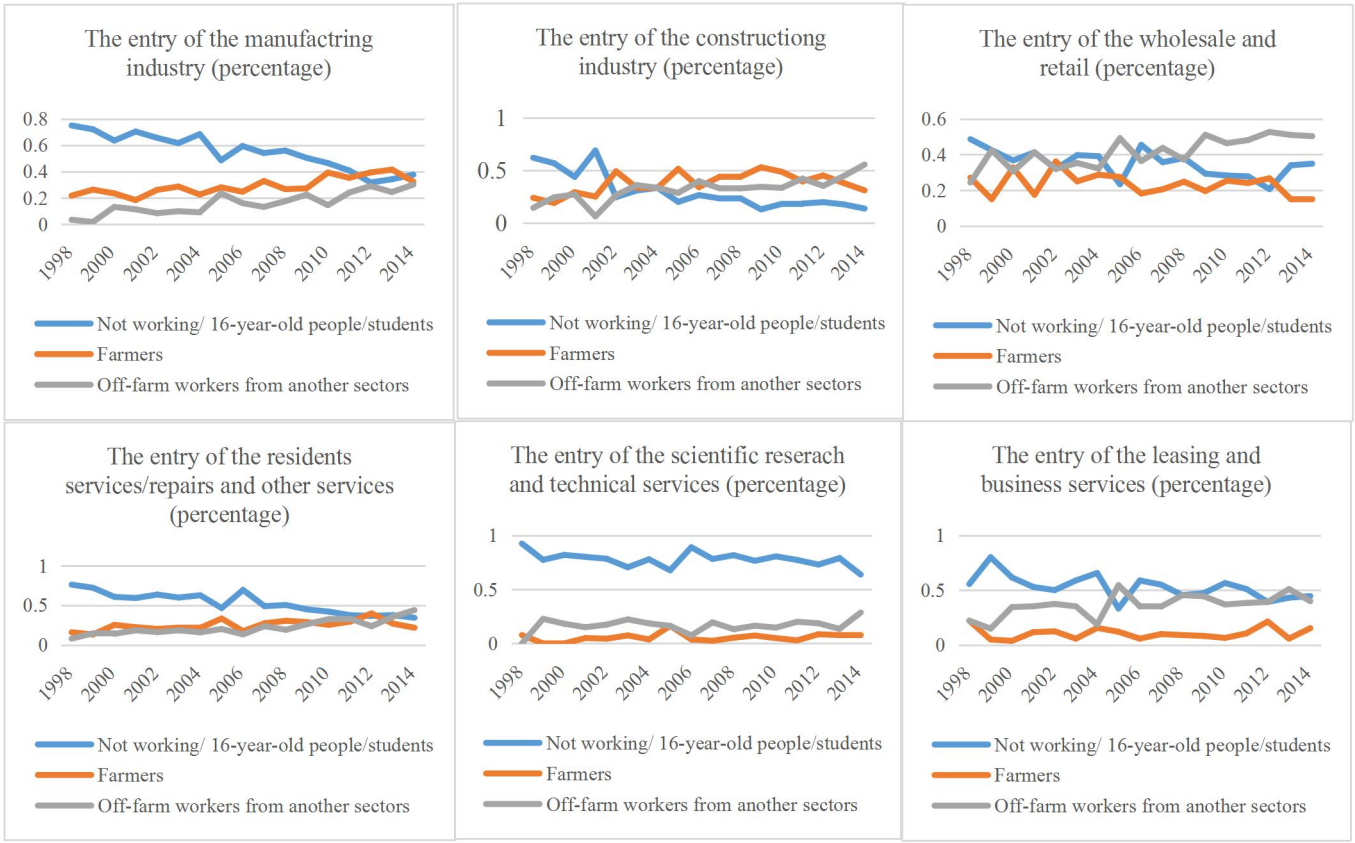
4.1 The entry of the major six sectors

On the whole, the new entering off-farm workers still account for the largest share of the labor entering the sectors and the off-farm workers from another sectors are only dominated in certain sectors at certain years (Figure 6). Except for construction industry, wholesale and retail, leasing and business services, the proportions of employment transformation in other sectors are less than 50% during sample period, but their average percentages are still below 50% (32.1%, 41.4%, 36.4% respectively). By examining employment trends, we find that the off-farm workers from another sectors have always been increasing between 1998 and 2015 and the sectors with rapid growth are construction industry, scientific research and technical services, wholesale and retail the average annual growth rates of which are 2.5%, 1.8%, 1.6%. Consistent with above findings of the employment adjustment among different industries, the data show that the main source of labor entering one sector is the new entering off-farm workers and the proportion of off-farm workers from another sectors is small. Of course, with the deepening of rural laborers' shift from rural to urban, the proportion of employment transformation has been rising.

2015), but our analysis more emphasis on the employment for the adjustment of economic structure changes, so we focus on the sector.

[12] The sector classification standard is the classification of the national economy of the China Statistical Bureau (GB / T 4754-2011).

[13] It is worth noting that the number of the off-farm workers transforming between two sectors, namely the worker transforming to one of the other sectors, is small, so that we add up the labor transforming to the other five sectors.

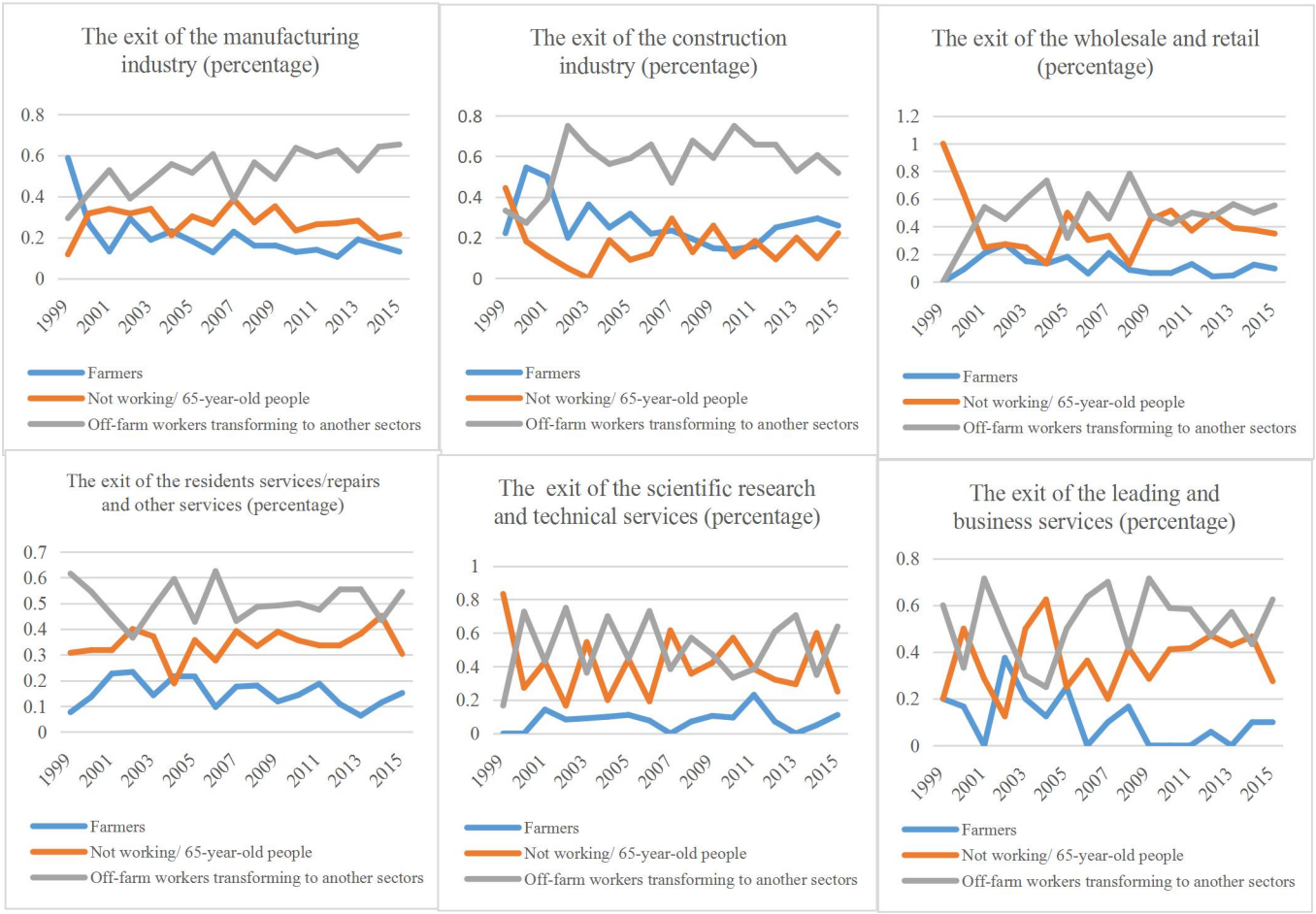


4.2 The exit of the major six sectors

In general, compared with the entry of one sector, the labor exiting one sector have a relatively high proportion of the off-farm workers transforming to another sectors (Figure 7). Except for the wholesale and retail, the proportions of employment transformation are more than 50% in other sectors which are 52.3%, 56.8%, 50.5% ,51.5% and 52.6%. The varying trend of employment transformation in one sector (except for the residents services/repairs and other services) is gradually ascending, and the fastest growing sector is the manufacturing industry, the proportion of which increased nearly 36 percentage points during the sample period[14]. Therefore, for the different types of labor exiting one sector, the off-farm workers transforming to another sectors are relatively more than the new entering off-farm workers and the proportion of employment transformation has been rising. However, since the number of off-farm workers exiting one industry/sector is much smaller than the new entering workers in one industry/sector, the entering labor play a major role throughout the employment adjustment process. Therefore, the investigation of the employment adjustment and the mechanism of employment flexibility at the sector level is consistent with the result of study at the industry level. That is, the employment transformation of the rural labor is difficult and the the new entering off-farm workers and original off-farm workers exiting the non-agricultural industry/sector reflect the employment flexibility, rather than the off-farm workers' smoother employment transformation among non-agricultural industries/sectors in labor markets.

[14] This is consistent with the shrinking of China's manufacturing industry and the structural adjustment of rural labor off-farm employment (the fastest decline in manufacturing employment compared to other non-agricultural sectors).

To sum up, on the basis of a seemingly flexible rural labor market, we have further studied the dynamic employment adjustment of different industries and sectors. We find that the individual is less likely to experience employment transformation. Then the problems are that why is it difficult for the rural labor to experience the employment transformation and which factors affect it. These questions will be explained in the next section.



Source:Author's survey

Figure 5. The entry of the major six sectors.

5. Multivariate analysis: determinants of the employment transformation

5.1 Modeling the determinants of the employment transformation

The willingness of a rural laborer who has been employed in off-farm employment and the ability to successfully change the job are affected by many factors. One of the most important is the supply and demand situation in the labor market, which will change at different time and in different regions.The other is the characteristics of the labor force itself, especially the impact of human capital. This paper starts with the model of the impact of the labor force on the employment transformation model, and further discusses the development of the labor market.

In order to understand the employment transformation more clearly, the model is set as follows:

$$Y_{ijt} = \delta \cdot X_{ijt} + \beta_t \cdot Year_t + \lambda_i \cdot Household_i + \varepsilon_{ijt}$$

Where i represents an individual, j represents the household of an individual, t represents the time. The dependent variable Y_{ijt} is a binary variable, according to the above description, it defines whether an individual has experienced employment transformation[15]. Specifically, for the different industries, the variable, Y_{ijt} , that equals 1 when individual i who employed in the secondary/tertiary industry transforms to the tertiary/secondary industry and is 0 when he still stay in the second / third industry. For the different sectors, the variable, Y_{ijt} , that equals 1 when individual i in one sector transforms to another sectors and is 0 when he still stay in the sector. Based on previous studies, X_{ijt} includes a series of individual variables: age, gender, marital status, education level, skill training, the political status[16], hukou, the ethnic. Considering the panel data we used, during this period, there may be various types of policy affecting the laborers' employment choice, social change, etc., in order to eliminate the time trend and the possible impact of annual events, we add the annual dummy variable. In addition, in order to deal with other omission variables that can not be observed, we include the household dummy variable in all regressions[17]. So that we can simultaneously control non-observed time and individual fixed effects to remove their effects. Table 1 exhibits the basic descriptive statistics for related variables.

Table1. Descriptive statistics of related variables in the model of employment transformation

Variable	Variable-definition	Obs	Mean	Variance	Min	Max
Employment transformation in the secondary industry	Transforming to the tertiary industry=1; Still stay in the secondary industry=0	43064	0.02	0.15	0	1
Employment transformation in the secondary industry	Transforming to the tertiary industry=1; Still stay in the secondary industry=0	49419	0.01	0.09	0	1
Employment transformation in the major six sectors	Transforming to another sectors=1; Still stay in the sector=0	102658	0.11	0.31	0	1
Employment transformation in the manufacturing industry	Transforming to another sectors=1; Still stay in the manufacturing industry=0	23828	0.10	0.30	0	1
Employment transformation in the construction industry	Transforming to another sectors=1; Still stay in the construction industry=0	15990	0.10	0.29	0	1

[15] This study far beyond the scope of rural labor market, it is difficult to grasp. In this paper, by controlling the time and geographical fixed effect, the impact of this factor is excluded.

[16] marital status, education level, skill training, and the political status are inherently endogenous, as these are the result of the choice of the individual, and the means of reducing endogeneity to the estimated threat is to add the years of parental education and the schooling grade. The estimations are very similar to the results reported in Table 2, and limited to space, we did not report the results.

[17] The large sample data used in this study allows us to control the fixed effect at the household level, which will address the most difficult missing variables in previous studies, such as personal intelligence, physical and other genetic characteristics and family social capital.

Employment transformation in the wholesale and retail	Transforming to another sectors=1; Still stay in the wholesale and retail=0	17601	0.11	0.32	0	1
Employment transformation in the residents services/repairs and other services	Transforming to another sectors=1; Still stay in the residents services/repairs and other services=0	18343	0.12	0.32	0	1
Employment transformation in the scientific research and technical services	Transforming to another sectors=1; Still stay in the scientific research and technical services =0	7874	0.11	0.31	0	1
Employment transformation in the leasing and business services	Transforming to another sectors=1; Still stay in the leasing and business services =0	6938	0.11	0.31	0	1
Age	Age in the t year	226710	36.37	12.81	16	65
Gender	Female=0; Male =1	226710	0.50	0.50	0	1
Marital status	Unmarried =0; Married=1	226710	0.94	0.23	0	1
Education level	Years of education	195906	8.47	3.25	1	22
Skill training	Unskilled =0; Skilled=1	226710	0.30	0.46	0	1
The political status	Non-party member=0; Party member=1	226710	0.08	0.27	0	1
Hukou	Non-agriculture accounts=0; Agriculture accounts=1	226710	0.84	0.37	0	1
The ethnic	Minority=0; Han=1	226710	0.92	0.28	0	1

Source:Author's survey

5.2 Results of the multivariate analysis

5.2.1 The results of industries

In this section, we present the results of the employment transformation between the secondary and the tertiary industry. In order to further analyze the evolution of the labor market over time, we estimate separately for three stages: 1998-2003, 2004-2010, 2011-2015 (Table 2). For the labor in the secondary industry transforming to the tertiary industry, those in younger age cohorts are more likely to transform to the tertiary industry, and the coefficient on the age variable implies the percentage of transforming to the tertiary industry increase by 2.7% for every year of a person ages (Table 2, column 1). Female transformation exceeds male transformation by 15.2 percent which is a very significant effect, and the impact of marriage is not significant (Table 2, columns 1; 2; 3 and 4). For the negative effects of age, we believe that the young labor force have stronger learning ability, significantly improved concepts adapting to the market[18] and the more flexible employment choice. However, this

[18] Lu Feng. China's labor market stable to the good [N]. China Labor Insurance News, 2015-07-22 (003).

negative effect reduces with time which conforms to the real economic restructuring. The gender impact is greater because of the differences in the occupational nature, work contents, working environment and working methods between different industries. Most of the rural laborers in the secondary are engaged in the low-skilled manual work, compared with the tertiary industry, the types and methods of work are slightly single and the employment threshold may higher for women. The impact of education is not significant, but the skill training has a large and significant effect in increasing the probability of individual's employment transformation (10.1%). Other coefficients (except for the political status) are not significant.

For the labor in the tertiary industry transforming to the secondary industry, there are difference in the effect of gender and the importance of human capital (Table 2, columns 5; 6; 7 and 8). On the contrary, male transformation exceeds female transformation by 30.6 percent which is a larger and significant effect compared to the secondary industry and this effect is increasing over time. In addition, there is an inverse U-shaped curve between education and employment transformation, and the impact of skill training is not significant. The effect of other variables are similar to the secondary industry.

Table 2. The determinants of the employment transformation between the secondary industry and the tertiary industry (sub-period)

Explanatory variables	Dependent variables							
	Transforming from the secondary industry to the tertiary industry				Transforming from the tertiary industry to the secondary industry			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age	-0.027***	-0.016	0.018	-0.060***	-0.031***	-0.085***	0.005	-0.044**
	(0.01)	(0.023)	(0.018)	(0.014)	(0.011)	(0.028)	(0.018)	(0.018)
The square of age	0.0002	0.00003	-0.001*	0.001***	0.0002	0.001**	-0.0003	0.0004
	(0.0001)	(0.00004)	(0.0003)	(0.0002)	(0.0002)	(0.0004)	(0.0003)	(0.0002)
Gender	-0.152***	-0.195**	-0.122**	-0.177***	0.306***	0.277**	0.272***	0.382***
	(0.034)	(0.088)	(0.056)	(0.051)	(0.046)	(0.130)	(0.076)	(0.067)
Martial status	0.0002	-0.048	0.119	0.022	-0.122	0.156	-0.003	-0.223**
	(0.070)	(0.304)	(0.147)	(0.089)	(0.079)	(0.421)	(0.161)	(0.108)
Years of education	0.038	0.098	0.026	0.030	0.118***	0.314***	0.078	0.122**
	(0.026)	(0.076)	(0.045)	(0.035)	(0.037)	(0.105)	(0.057)	(0.055)
Square Years of education	-0.0002	-0.003	0.0004	0.0001	-0.009***	-0.018***	-0.007**	-0.009***
	(0.001)	(0.004)	(0.002)	(0.002)	(0.002)	(0.006)	(0.003)	(0.003)
Skill training	0.101***	0.223***	0.046	0.112**	-0.058	-0.177	0.013	-0.071
	(0.032)	(0.079)	(0.052)	(0.046)	(0.044)	(0.115)	(0.075)	(0.063)
The political status	0.379***	0.548***	0.362***	0.302***	-0.051	0.176	-0.275**	0.020
	(0.063)	(0.122)	(0.105)	(0.102)	(0.070)	(0.165)	(0.128)	(0.102)
Hukou	0.037	0.075	0.055	-0.005	0.117*	0.122	0.010	0.289***
	(0.054)	(0.127)	(0.089)	(0.080)	(0.064)	(0.164)	(0.098)	(0.105)
The ethnic	-0.099		-0.064	-0.362	-0.148	0.637**	0.242	-0.510**
	(0.152)		(0.242)	(0.232)	(0.163)	(0.270)	(0.294)	(0.219)

Annual fixed effect	Control	Control	Control	Control	Control	Control	Control	Control
Household fixed effect	Control	Control	Control	Control	Control	Control	Control	Control
N	39596	8689	13616	13268	41450	5119	11850	14384

Source:Author's survey

Notes: Standard deviation in parentheses, *** indicates significance at 1% level, ** indicates significance at 5% level,* indicates significance at 10% level.

5.2.2 The results of sectors

For the labor in one sector transforming to another sectors, there is an U-shaped curve between age and employment transformation, male transformation among sectors is more than 7.7 percent higher than female transformation during the entire sample period and the impact has been downward trend (Table 3). The individual married or not doesn't matter. Education less than the threshold (8 years or so) increases the individual's employment transformation, but the higher the level of education, the smaller the probability of employment transformation once exceeded the threshold. And the critical value is increasing with time which means that education for the employment transformation of rural labor becomes more and more important. Skill training has an even larger effect (7.7%), but the impact is gradually weakening. Other coefficients also correspond with the common sense.

Table 3. The determinants of the employment transformation among different sectors (sub-period)

Explanatory variables	Explanatory variables			
	Transforming from one sector to another sectors			
	(1)	(2)	(3)	(4)
Age	-0.078***	-0.084***	-0.077***	-0.081***
	(0.005)	(0.012)	(0.008)	(0.008)
The square of age	0.001***	0.001***	0.001***	0.001***
	(0.0001)	(0.0002)	(0.0001)	(0.0001)
Gender	0.077***	0.103**	0.146***	0.029
	(0.018)	(0.047)	(0.033)	(0.024)
Martial status	0.050	0.040	-0.028	0.079
	(0.038)	(0.160)	(0.072)	(0.048)
Years of education	0.048***	0.025	0.0393*	0.058***
	(0.012)	(0.032)	(0.022)	(0.016)
Square Years of education	-0.003***	-0.001	-0.003**	-0.003***
	(0.001)	(0.002)	(0.001)	(0.001)
Skill training	0.077***	0.033	0.051*	0.106***
	(0.018)	(0.043)	(0.030)	(0.025)
The political status	0.076***	0.274***	0.038	0.018
	(0.028)	(0.059)	(0.050)	(0.040)
Hukou	0.047*	0.023	-0.008	0.092***
	(0.025)	(0.057)	(0.044)	(0.034)
The ethnic	-0.225***	-0.244*	-0.097	-0.291***

	(0.061)	(0.137)	(0.114)	(0.090)
Annual fixed effect	Control	Control	Control	Control
Household fixed effect	Control	Control	Control	Control
N	95946	22362	31768	40508

Source:Author's survey

Notes: Standard deviation in parentheses, *** indicates significance at 1% level, ** indicates significance at 5% level,* indicates significance at 10% level.

Although table 3 shows that the factors affecting the rural labor transforming to another sectors, considering the labor heterogeneity, we report separately the rural laborers' influencing factors of employment transformation in different sectors over the whole time period (Table 4). The results from (1) to (6) correspond to the major six sectors of rural labor with the same classification (Figure 2). Consistent with the overall estimates, there are also an U-shaped curve between age and employment transformation in all sectors. Except for the construction industry, male employment transformation exceeds female employment transformation in the other sectors and the largest and smallest effect of the sectors are the scientific research and technical services (18.7%) and leasing and business services (2.0%). Our results also show the impacts of martial status and education (except for the the scientific research and technical services) are still not significant. The influences of skill are somewhat complex, skill training increase the individual's employment transformation in the manufacturing industry (21.6%) and the leasing and business services (40.7%), but it has a negative influence in the scientific research and technical services (-27.6%) and has no significant effect in other sectors (Table 3, columns 2; 3 and 4).

Table 4. The the determinants of the employment transformation in different sectors

Explanatory variables	Explanatory variables					
	Transforming from the sector to another sectors					
	(1)	(2)	(3)	(4)	(5)	(6)
Age	-0.036***	-0.099***	-0.116***	-0.061***	-0.118***	-0.098***
	(0.011)	(0.015)	(0.014)	(0.012)	(0.023)	(0.026)
The square of age	0.0004**	0.001***	0.002***	0.0007***	0.002***	0.001***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)
Gender	0.110***	-0.246***	0.130**	0.134***	0.187**	0.020
	(0.036)	(0.095)	(0.056)	(0.049)	(0.092)	(0.105)
Martial status	-0.058	-0.104	0.055	-0.028	-0.091	0.177
	(0.079)	(0.123)	(0.133)	(0.077)	(0.184)	(0.239)
Years of education	0.009	0.042	0.055	-0.046	0.166**	0.057
	(0.031)	(0.042)	(0.037)	(0.038)	(0.079)	(0.068)
Square Years of education	-0.00003	-0.002	-0.003	0.004**	-0.009***	-0.008**
	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
Skill training	0.216***	0.003	0.049	-0.034	-0.276***	0.407***
	(0.036)	(0.057)	(0.060)	(0.048)	(0.102)	(0.114)
The political status	0.191**	0.415***	0.305***	0.083	0.136	-0.197
	(0.078)	(0.108)	(0.081)	(0.088)	(0.105)	(0.141)

Hukou	0.146**	0.199*	-0.170**	-0.038	0.136	0.162
	(0.062)	(0.118)	(0.074)	(0.063)	(0.098)	(0.106)
The ethnic	-0.507***	-0.395*	-0.357*	-0.245*	-0.267	-0.215
	(0.190)	(0.211)	(0.184)	(0.138)	(0.267)	(0.393)
Annual fixed effect	Control	Control	Control	Control	Control	Control
Household fixed effect	Control	Control	Control	Control	Control	Control
N	20655	12803	14187	15070	5637	3946

Source:Author's survey

Notes: Standard deviation in parentheses, *** indicates significance at 1% level, ** indicates significance at 5% level,* indicates significance at 10% level.

6. Conclusions

In this paper, we observe the employment history of rural labor between 1998 and 2015 at two levels: the industry and sector and discuss the evolution of China's rural labor markets. What's more, based on the analysis of the flexible rural labor market we focus on the mechanism of employment flexibility in rural China. In our disaggregation of labor, we show that whether at the industry level or in the sectors, the employment adjustment all demonstrate the existence of flexible rural labor markets. The discussions about dynamic adjustment process illustrate that new entering off-farm workers and original off-farm workers exiting the non-agricultural industry/sector reflect the employment flexibility, rather than the off-farm workers' smoother employment transformation among non-agricultural industries/sectors in the labor market. Finally, the empirical model for multiple regression analysis and the estimation shows that the relative lack of human capital is still the main factor.

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