Analysis of influencing factors of rural labor force participation in new employment patterns——Based on the empirical research of Harbin

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Abstract. Since the outbreak of the new crown epidemic in late 2019, the global economy has experienced sluggish growth and downward pressure on our economy has increased. This has not only had a huge impact on traditional contact consumption, but has also had a serious impact on employment in our economy. For labour employment, the iterative upgrading of industries, the widening of employment channels and the increased flexibility of the labour market have broken the inherent perception of labour and overturned traditional forms of employment, with new employment forms rapidly emerging with their characteristics such as flexibility in the form of employment. New forms of employment such as platform employment, innovation and entrepreneurship and flexible employment have emerged on this basis. This economic development model has made an important contribution to the solution of rural labour force employment. Based on data from 550 case interviews in Harbin, this paper uses a binary logistic regression model to empirically analyse the factors influencing rural labour force participation in new employment patterns.

Keywords: Rural labour force; New employment patterns; Employment; Logistic regression analysis

1 Introduction

Since the outbreak of the new crown epidemic in late 2019, the global economy has experienced sluggish growth and downward pressure on our economy has increased. In the face of the employment problem, General Secretary Xi Jinping pointed out in the report of the 20th Party Congress that we should adhere to the employment priority strategy, give more prominence to solving the employment problems of the people, and strive to create more jobs. The development of the times requires the intrusion of new forms of employment, and the Internet leads the innovation of employment forms to drive the growth of labour employment and create a strong engine for common development and prosperity. Therefore, we have to move in response to the trend and follow it.

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For labour and employment, the iterative upgrading of industries, the widening of employment channels and the increased flexibility of the labour market have broken people's inherent labour perceptions and overturned traditional forms of employment, with new forms of employment rapidly emerging with features such as the flexibility of their employment forms. Since 2015, when the Fifth Plenary Session of the 18th Party Central Committee first proposed to support the development of new industries, new employment forms have developed rapidly under the government's encouragement and support policies. The National Information Center《China Sharing Economy Development Report》 (2021) shows that the number of participants in the sharing economy will be approximately 830 million in 2020, including approximately 84 million service providers, an increase of 7.7% year-on-year. The new employment patterns formed in the context of the digital economy have achieved a shift from fixed to flexible employment, from traditional to emerging employment, from employment for hire to flexible employment, and from professional to complex employment. In November 2015, the Department of Human Resources and Social Security of Heilongjiang Province formulated《Three-Year Action Plan for "Internet + Human Society"》. New employment patterns such as platform employment, innovative entrepreneurship and flexible employment have emerged on this basis. This economic development model has made an important contribution to the employment of rural workers. According to the Statistical Yearbook, in 2021, the rural population of Heilongjiang province was 10.722 million, accounting for 34.3% of the total population, with 5.28 million people employed in rural areas, and 5.465 million farmers in the province have been transferred to employment so far. With the increasing efficiency of agricultural production, a large surplus of labour will be generated in rural areas of Heilongjiang Province. Although Heilongjiang Province has implemented the "hanging hoe period" to transfer employment of farmers, guiding farmers to use the agricultural leisure period for flexible employment in the vicinity, and organizing "peer-to-peer" transportation of 9,371 batches of 126,000 people to promote the employment of poor labourer. However, due to the low level of economic development in rural areas and the limited competitiveness of the rural labour force, the phenomenon of surplus rural labour force is still relatively obvious, and the solution to the employment problem of rural labour force in Heilongjiang Province is still a long way off.

Against this background, this paper takes Heilongjiang Province as the research perspective, and through the analysis of the current situation of rural labour force participation in new employment patterns in Heilongjiang Province, identifies the opportunities, problems and causes of rural labour force participation in new employment patterns in Heilongjiang Province, explores the influencing factors of rural labour force participation in new employment patterns in Heilongjiang Province through descriptive statistical analysis and model building, and puts forward practical suggestions for promoting rural labour force participation in new employment patterns in Heilongjiang Province.

2 literature Review

Regarding new employment patterns, our government first included the concept of new employment patterns in the government communique at the Fifth Plenary Session of the 18th Party Congress in 2015, and explicitly proposed to pay attention to the impact of flexible employment on labour allocation in the labour market, rightly support the development of new forms of employment, and actively formulate and implement policies to promote workers' independent employment. From a microeconomics perspective, Li Haijian and Professor Li Yan (2020) from the Institute of Quantitative and Technical Economics of the Chinese Academy of Social Sciences outlined the creation of new economic employment forms due to ten new economic forms such as the sharing economy, platform economy and odd jobs economy brought about by the new round of technological revolution[1]. Researcher Zhu Songling (2018) from the Beijing Municipal Office of Philosophical and Social Science Planning argues that the new employment pattern is a type of employment extended by the development of traditional industries based on the Internet platform[2]. According to Chen Xiaohua, a scholar from the Ministry of Agriculture of China (2015), the development of Internet technology has given rise to industrial upgrading and corresponding supporting employment patterns, which are referred to as new industries[3]. Researchers Wang Yan and Zhang Lihua (2019) from the China Institute of Labour Movement of the All-China Federation of Trade Unions (ACFTU) define new employment forms as forms that are opposed to traditional standard employment forms. The traditional employment form is mainly offline and labour relations are regulated through labour contracts; whereas the main body of the new employment form is the platform enterprise, which emphasizes the independence and flexibility of the employment subject[4].

New forms of employment in the digital economy play an important role in addressing the employment of special groups such as migrant workers, women and laid-off workers. Marina S ,Olga Z ,Farida M have studied the impact of the digitization of the economy on workers' willingness to work[5].Hamouche S ,Chabani Z have studied the new flexible employment relationships in the face of the pandemic[6].When visiting the Ministry of Human Resources and Social Security in 2016, Premier Li Keqiang pointed out that the employment of migrant workers absorbed by traditional industries was declining, and that there was a need to find another way to gradually lead migrant workers to the new economy, new industries and new business forms through information and consultation, skills training and other means, so as to improve the quality of employment and family well-being of migrant workers, and in 2017, at an executive meeting of the State Council, he again emphasized the importance of the new economy and new business forms as a new dynamic force and For solving the employment problem. A research report released by the Political Research Office of the National Development and Reform Commission (2016) also pointed out that the emergence of new economy and new dynamic energy has given rise to the creation and development of new employment patterns and has a significant impact on employment development, especially for special groups such as migrant workers and college graduates. The most direct manifestation of this is the significant increase in the employment absorption capacity of the tertiary service industry, and the significantly

increased ability of groups such as migrant workers and college graduates to return to their hometowns and start their own businesses to drive employment.

3 Study design

3.1 Sample source and variable assignment

3.1.1 Sample source.

The research was conducted in nine districts and nine counties (cities) of Harbin City, targeting rural household workers engaged in non-agricultural employment. The survey focused on the basic personal information of rural labourer, employment methods, wage levels, social security, difficulties and assistance faced, etc. The data from the valid questionnaires were collected and counted. A total of 550 questionnaires were distributed, and after 54 invalid questionnaires were excluded, 496 valid questionnaires were finally obtained, including 419 newly employed workers and 77 traditionally employed workers, with an overall recovery rate of 90.09%. The specific frequency distribution is shown in Table 1.

Table 1. Individual variables and frequencies

Variable		Frequency
Gender	Male	272
	Female	224
Age	30 years and under	170
	31-40 years	124
	41-50 years	119
	51-60 years	63
	61 years and over	20
Nationality	Han	274
	Manchu, Korean, Hui, other ethnic groups, etc.	222
Educational Attainment	Junior high school and below	122
	Senior high school	172
	Technical Secondary school	79
	Junior college	83
	Bachelor's degree and above	40
Marital Status	Unmarried	150
	Married	346
Internet Usage	Never	1
	Seldom	3
	Now and then	10
	Non-recurrent	63
	Extremely frequent	419
Income Level	2500 and below	79
	2501-4500	118
	4501-5500	144
	5501-7000	90
	7001 and above	65

Labour Contract	Signing of labour contracts	118
	Signing of Service contracts	102
	Oral agreement	121
	No contracts signed	124
	Currently unknown	31
Social Security	No insurance paid	100
	Payment of basic pension and health insurance	127
	Co-payment of insurance with the employer	118
	Payment of insurance by intermediaries	68
	Purchase of commercial insurance	59
	Currently unknown	24
Vocational skills training	Attended training	119
	No training attended	277
Public Employment Guidance Service	Received employment guidance service	117
	Have not benefited from employment guidance service	279
Level of knowledge of new employment patterns	Unknown	266
	General knowledge	157
	Learn about	73

3.1.2 Variable assignment.

The explanation and assignment of specific variables are shown in Table 2.

Table 2. Interpretation and assignment of variables

Variable Symbol	Variable Name	Assign a value
Y	Participation in new employment patterns	No = 0; Yes = 1
X_1	Gender	Male = 0; Female = 1
X_2	Age	30 and under = 1; 31-40 = 2; 41-50 = 3; 51-60 = 4; 61 and over = 5
X_3	Ethnicity (with reference to Han)	Han = 0;Manchu, Korean, Hui, other ethnic groups, etc. = 1
X_4	Educational Attainment	Junior high school and below = 1; Senior high school = 2; Technical secondary school = 3; Junior college=4; Bachelor's degree and above = 5
X_5	Marital Status	Unmarried = 1; Married = 2
X_6	Internet Usage	Never = 1;Seldom= 2; Now and then= 3; Non-recurrent= 4; Extremely frequent= 5
X_7	Income Level	2500 and below=1; 2501-4500 =2; 4501-5500 = 3; 5501-7000 = 4; 7001 and above = 5
X_8	Labour Contract	Not signed = 0; signed = 1
X_9	Social Security	Not paid = 0; paid = 1
X_{10}	Vocational skills training	Attended training=0; No training attended= 1
X_{11}	Public Employment Guidance Service	No enjoyment = 0; enjoyment = 1
X_{12}	Level of knowledge of new employment patterns	Unknown=1;General knowledge=2; Learn about= 3

3.2 Modelling

Since the dependent variable "whether to re-employ" is a dichotomous variable, there are only two possibilities for the outcome: "yes" and "no", a binary logistic model regression is used to analyse the factors affecting the re-employment of the elderly. The basic form of the logistic regression equation is:

$$\text{Logit}(P)=Ln(\frac{\mathbf{p}}{\mathbf{1-p}})=\alpha+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_i X_i \quad (1)$$

$$P=\frac{\exp(\boldsymbol{\beta_1 X_1 \beta_2 X_2 \beta_3})}{\mathbf{1+\exp(\beta_1 X_1 \beta_2 X_2)}} \quad (2)$$

where equation (2) can be derived from equation (1). In equation (2) P denotes the probability that the dependent variable is 0 (not participating in the new employment pattern) or 1 (participating in the new employment pattern), α is a constant term, and $\beta 1$, $\beta 2$, ... βi are the coefficients of the independent variable X.

4 Empirical analysis

4.1 Collinearity diagnosis

Considering the relatively large number of argument and the possible correlation between the 13 factors, it is necessary to diagnose the covariance of the 13 factors before performing binary logistic regression analysis. Tolerance and Variance Inflation Factor (VIF) can measure multicollinearity, if tolerance $\leqslant$ 0.1 or VIF $\geqslant$ 10, it indicates that there is a serious multicollinearity situation between independent variables.As shown in Table3,Table 3 gives the covariance diagnostic results for the 12 factors, and it can be seen that the tolerances are all above 0.8 and the VIF are all much less than 10, indicating that there is no multicollinearity situation between the above 12 variables. Next, binary logistic regression analyses were performed on these 13 independent variables.

Table 3. Collinearity diagnostic results

Variable	Collinearity Statistic	
	Tolerances	VIF
Gender	0.962	1.040
Age	0.977	1.024
Ethnicity	0.971	1.030
Educational Attainment	0.979	1.021
Marital Status	0.977	1.024
Internet Usage	0.960	1.041
Income Level	0.950	1.052
Labour Contract	0.880	1.136
Social Security	0.851	1.176
Vocational skills training	0.859	1.163
Public Employment Guidance Service	0.856	1.169
Level of knowledge of new employment patterns	0.982	1.019

4.2 Binary Logistic regression analysis

Binary Logistic regression analysis was carried out using SPSS 23.0 and the results of the regression analysis are given in Table 4.

Table 4. Results of binary logistic regression analysis

Variant	B	S.E.	Wald	df	Sig.	Exp（B）
Gender	-0.228*	0.126	3.254	1	0.071	0.796
Age	-0.128	0.434	0.087	1	0.768	0.880
Ethnicity	0.339	0.257	1.740	1	0.187	1.404
Educational Attainment	0.328***	0.109	8.986	1	0.003	1.388
Marital Status	-1.83	0.283	0.418	1	0.518	0.833
Internet Usage	0.629**	0.268	5.502	1	0.019	1.876
Income Level	-0.753***	0.278	7.341	1	0.007	0.471
Labour Contract	0.588**	0.282	4.340	1	0.037	1.800
Social Security	0.787***	0.254	9.590	1	0.002	2.196
Vocational skills training	0.560**	0.209	5.154	1	0.015	1.751
Public Employment Guidance Service	0.426***	0.107	15.740	1	0.000	1.531
Level of knowledge of new employment patterns	0.118**	0.360	4.210	1	0.013	1.125
constant term (math.)	-1.517**	0.668	5.158	1	0.023	0.219

Note:*P<0.1,**P<0.05,***P<0.01

According to Table 4, the binary logistic regression model can be derived as:

$$P\{Y=1\}=\frac{\exp(-1.517-0.228X_1-0.128X_2+0.339X_3+0.328X_4-1.830X_5+0.629X_6-0.753X_7+0.588X_8+0.787_90.560X_{10}0.426X_{11}+0.118X_{12})}{1+\exp(-1.517-0.228X_1-0.128X_2+0.339X_3+0.328X_4-1.830X_5+0.629X_6-0.753X_7+0.588X_8+0.787_90.560X_{10}0.426X_{11}+0.118X_{12})}$$

According to the Sig in Table 4, it can be seen that there are eight significant factors affecting rural labour force participation in new employment patterns at the 0.05 level of significance: educational attainment, internet usage, income level, labour contract, social insurance, vocational skills training, public employment guidance services, and level of knowledge about the new employment patterns.

As can be seen through B and Exp (B) in Table 4: Gender is negatively correlated with rural labour force participation in new employment patterns, and the incidence ratio of female rural labour force participation in new employment patterns decreases by 20.4 per cent relative to male rural labour force;Age is negatively correlated with the participation of the rural labour force in new forms of employment, with the incidence of participation in new forms of employment decreasing by 0.12 per cent for those with a higher age compared to those with a lower age;Ethnicity is positively related to rural labour force participation in new employment patterns, with the incidence rate of rural labour force participation in new employment patterns for Han Chinese being 1.404

times higher than that for other ethnic groups; Educational attainment is positively related to rural labour force participation in new employment patterns, with the incidence rate of rural labour force participation in new employment patterns for rural labour force with a low level of literacy being 1.388 times higher than that for rural labour force with a high level of literacy; Marital status is negatively related to rural labour force participation in new employment patterns, Marital status is negatively correlated with rural labour force participation in new employment patterns, with the incidence of unmarried rural labour force participation in new employment patterns, with the incidence of unmarried rural labour force participation in new employment patterns decreasing by 16.7 per cent compared with that of married rural labour force; Internet use is positively correlated with the participation of the rural labour force in new forms of employment, with the incidence of participation in new forms of employment of the rural labour force with regular and frequent use of the Internet being 1.876 times higher than the incidence of participation in new forms of employment of the rural labour force that does not use the Internet; The level of income is negatively correlated with the participation of the rural labour force in new forms of employment, with the incidence of participation in new forms of employment decreasing by 52.9 per cent for those with higher incomes compared to those with lower incomes; There is a positive correlation between labour contracts and the participation of the rural labour force in new forms of employment, with the incidence of participation in new forms of employment being 1.800 times higher for those with labour contracts than for those without; There is a positive correlation between social insurance and the participation of the rural labour force in new forms of employment, with the incidence of participation in new forms of employment of the rural labour force that pays social insurance being 2.196 times higher than that of the rural labour force that does not pay social insurance; Vocational skills training is positively correlated with the participation of the rural labour force in new forms of employment, with the incidence of participation in new forms of employment of the rural labour force that has participated in vocational skills training being 1.751 times higher than the incidence of participation in new forms of employment of the rural labour force that has not participated in vocational skills training; There is a positive correlation between public employment guidance services and the participation of the rural labour force in new forms of employment, with the incidence of participation in new forms of employment of the rural labour force that has benefited from public employment guidance services being 1.531 times higher than the incidence of participation in new forms of employment of the rural labour force that has not benefited from public employment guidance services; Knowledge of new employment patterns is positively correlated with rural labour force participation in new employment patterns, with the incidence of rural labour force participation in new employment being 1.531 times higher for those who are aware of new employment patterns than for those who are not.

5 Conclusion and recommendations

In this paper, by examining the basic personal characteristics, basic employment characteristics, and socioeconomic characteristics of the rural labour force group in Harbin City, and by applying the binary Logistic regression analysis method, we have come up with the significant influencing factors of the rural labour force's participation in the new employment pattern. As a result, the following conclusions are drawn:

Firstly, among the basic personal characteristics of the rural labour force group, gender, age, ethnicity, and marital status are not significant factors influencing the participation of the rural labour force in new employment patterns, while literacy and Internet use have a significant impact on the participation of the rural labour force in new employment patterns .First, the higher the level of education of a worker, the greater the advantage he or she has in the labour market, and he or she will have more opportunities to choose when participating in new employment patterns, coupled with the fact that workers with a high level of education have a more enlightened and broader concept of employment, the probability that they are willing to engage in new forms of employment will be higher; workers who frequently contact and use the Internet will be able to learn about the latest employment information, and they will be more aware of new forms of employment and be more willing to choose new forms of employment than those who don't frequently use the Internet .

Secondly, among the basic characteristics of employment of the rural labour force group, the level of income, labour contracts, social insurance and vocational skills training have a significant impact on the participation of the rural labour force in the new employment pattern. Workers are attracted by the high incomes generated by the new forms of employment, and many have expressed a preference for participating in the new forms of employment, which are effective in raising the incomes of the population and in sustaining the livelihoods of their families; In the course of the survey, it was found that many workers still attach great importance to the signing of labour contracts, as the new forms of employment are more difficult than traditional employment in terms of identifying the labour relationship and defending their rights, and therefore workers attach great importance to the signing of labour contracts when choosing to participate in the new forms of employment; The payment of social insurance has a positive effect on participation in new forms of employment, and surveys have found that many workers attach great importance to the payment of social insurance by their platforms or establishments, and that workers want to have basic protection during their working life to reduce their worries; Vocational skills training can help transform workers into skilled, knowledgeable and innovative workers, facilitating better absorption of rural labour in new employment patterns.

Thirdly, among the socioeconomic characteristics of the rural labour force group, public employment guidance services and the level of knowledge of new employment patterns have a significant impact on the participation of the rural labour force in new employment patterns. The probability of rural labourer participating in new employment patterns will increase after they have enjoyed public employment guidance services; improve the corresponding public employment service system, so that workers can join new employment patterns after obtaining timely and accurate employment

information; workers will not blindly choose occupations they are not familiar with, and the higher the probability that workers who know more about the new employment patterns will choose the new employment patterns will be higher.

This paper preliminary discusses the issue of influencing factors of rural labour force participation in new employment patterns, however, the actual influencing factors are much richer and more complex than those reflected in the current indicators, and the sample size is not broad enough, so it is necessary to find out the deep-rooted factors influencing the participation of rural labour force in new employment patterns, and to construct a more complete system of influencing indicators.Therefore, the follow-up issues can be further deepened from the above problems, with a view to promoting the rural labour force in Harbin City to achieve high-quality employment, promoting the rational development and utilization of rural labour resources, and promoting the sustained and healthy development of the social economy.

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