

The Impact of Internet Development on Labor Mobility

Sunan Ji *

School of Economics & Management, NJUST, Nanjing, China

* Corresponding Author Email: xisum@qq.com

Abstract. This paper makes a theoretical analysis on the impact of Internet development on the floating population's willingness to stay. It uses the method of principal component analysis to measure the Internet development level of 290 cities in China. On this basis, it matches the micro data of individual labor force and empirically tests the impact of Internet development on the floating population's willingness to stay. The research finds that the development level of urban Internet will limit and reduce the migrant population's willingness to emigrate. For each unit of urban Internet development, the possibility of labor force's intention to emigrate from the city will be reduced by 11.44%; Compared with the middle-aged and the old and the low skilled labor force, the middle-aged and the young and the high skilled urban labor force are more sensitive and responsive to the Internet, and are more likely to be encouraged by the development of the Internet and choose to stay in their cities. This study provides policy implications for urban talent attraction and labor competition.

Keywords: Internet Development; Labor Mobility; Floating Population; Probit Model.

1. Introduction

As a large population country, China has a large number of migrant labor groups. Since the reform and opening up, along with the advancement of the marketization process and the rapid development of the national economy, there has been a large-scale population flow across the country. The seventh national population census data released in May 2021 shows that China's floating population is 375.82 million, including 124.84 million trans provincial floating population and 250.98 million intra provincial floating population. Compared with the sixth national population census in 2010, the floating population increased by 154.39 million, or 69.73%. Population flow is still active, and the inconsistency between residence and registered residence is quite common. In 2020, the population separated from households reached 493 million, accounting for about 35% of the total population, and it shows a prominent regional imbalance. The floating population continues to gather along the river, coastal areas and inland urban areas, especially the developed cities in the East and the core cities in the central and western regions have become the main destinations of population migration.

Under the current situation of fertility and population development in China, the attraction of labor stock has become an important part of regional competition. It is undeniable that China's fertility rate will remain low for a period of time to come, the population size will show a downward trend, and the flow of urban population across the country will also tend to be gentle. As an important link of urban growth and development, human capital accumulation has become a consensus of all regions. In this context, in order to attract the inflow of labor, especially highly skilled labor, major cities including Shanghai, Tianjin, Guangzhou, Chongqing, Chengdu, Wuhan, Zhengzhou and Xi'an have started a "competition for talent", and have launched many talent attraction policies, such as housing subsidies, settlement preferences, family relocation Living subsidies, scientific research support, etc. are expected to attract highly skilled and highly educated labor through rich conditions, accumulate human capital for the city, and ensure the sustainable prosperity and development of the economy and society.

With the progress of information and communication technology, the Internet era of connectivity has come. On the one hand, the Internet economy has broken through the restriction of geographical distance on information transmission and improved the convenience of information transmission; On the other hand, the Internet has reduced the cost of information, promoted the rational allocation of resources, and reshaped the pattern of resource allocation. The Outline of the National Informatization Development Strategy requires that information technology should be used throughout the

modernization process of our country, the huge potential of information technology development should be released, modernization should be driven by information technology, and the construction of a network power should be accelerated. As of December 2020, the overall size of China's Internet users has reached 989 million, accounting for about one-fifth of the global Internet users. China's digital economy has reached 39.2 trillion yuan, accounting for 38.6% of GDP. The Internet has become an important driving force for China's economic growth. At the same time, the surge of network information has made people increasingly dependent on information resources. The Internet has gradually become the mainstream communication mode, reshaping people's life and production mode, and has increasingly important influence on production and life.

As China's economy has entered a new stage of high-quality development, under the background of increasing demand for labor force in cities and increasingly fierce competition for talents, the competition for talents and labor force among cities has gradually become the focus of the new era. What cities rely on to attract and retain talents gives new vision and perspective to the research of labor force allocation. The rapid development of the Internet will have many impacts on all aspects of economic and social development. So what role does the Internet play in cross-border labor mobility? What kind of labor can the Internet attract and retain? Answering these questions is of positive and rich significance.

2. Literature review and research hypothesis

The neo classical labor economics theory believes that the matching process between the supply and demand sides of the labor market is cost free. The labor market is information symmetric. Given a specific wage level, the market can always match the right workers. But in reality, there is information asymmetry between the supply and demand sides of the labor market. The development of the Internet alleviates the problem of information asymmetry in the labor market and provides a new channel for information exchange between labor and capital. Compared with traditional information acquisition methods such as television and newspapers, the Internet has incomparable low cost and convenience in information acquisition. Job search theory shows that direct search cost and opportunity cost will have an important impact on individual employment decision-making. As an important tool for job search, the Internet can change the matching mode between supply and demand, expand the availability of employment information, reduce labor search costs, and improve the efficiency of labor factor market matching while alleviating information asymmetry. The study found that the penetration rate of the Internet in cities is positively related to the intensity of the unemployed looking for work [1]. That is, the development of the Internet has increased the probability of the unemployed looking for work. If the study is refined to the proportion of people using the Internet in different ways of looking for work, it can be found that the Internet can increase the opportunities of direct contact between job seekers and employment units, and reduce the duration of unemployment of the unemployed [2]. The development of the Internet, on the one hand, shortens the time it takes for the labor force to find a job, on the other hand, reduces the risk of cross regional labor mobility, and reduces the labor force who returns to the original place of emigration due to failure to realize the expected mobility benefits. In general, the development of the Internet is conducive to the labor force obtaining more employment information, making it easier to find jobs, thus inhibiting the outflow of labor force.

As a catalyst for the new economic business, the Internet, despite the elimination of old processes and production lines, has also created many new forms of labor and jobs [3]. New service forms such as the Internet of Things, biotechnology, nanotechnology and so on may provide enough jobs, which can make up for the number of replaced and eliminated jobs on a macro level. Internet technology has not only replaced some low value-added jobs, but also created other forms of low content jobs. For example, assembly workers have been largely replaced, but at the same time, the supply of jobs such as delivery and express delivery is in short supply. While the Internet is creating new industries and expanding employment opportunities, it also makes the labor force more diversified and rich in

employment choices. Flexible jobs such as express train, driving agency, WeChat business, purchasing agency, We Media, etc. have emerged. On the whole, the development of the Internet provides new employment opportunities and more flexible employment methods for the labor force, which helps the floating population to find employment in the cities, thus curbing their willingness to outflow.

The popularity and application of the Internet have completely changed the traditional social communication methods of communication by telephone, telegram or letter, providing a platform and tool for individuals to make online social contacts and maintain contacts, helping people establish and maintain friendship and broaden social networks. According to the cost-benefit analysis theory, the development of the Internet has reduced the psychological cost of the floating population, that is, the psychological cost of leaving the original familiar working environment, living environment or relatives and friends, adapting to the new environment and establishing new interpersonal relationships, etc., has restrained the willingness of the floating population to move back to a certain extent.

The wide application of Internet technology enables various types of knowledge and educational resources to be transmitted to all corners of the network through Internet terminals, broadens the access to public resources, and greatly improves the sharing of public resources; The whole society's ability to process and process Internet information has also been improved. People can independently learn new knowledge and skills through the Internet to improve their human capital level. User groups, including workers, can spend less to obtain new information and master new skills, which has become an important supplement to the traditional education and training system, promoting the continuous improvement of the quality of human capital and enhancing their employment advantages, This will make it easier for the labor force to find a satisfactory job and obtain the income that meets the psychological expectation, thus reducing the willingness to leave the city and continue to flow. In addition, the improvement of Internet technology has made telemedicine a reality. Some studies have found that the improvement of the level of public service supply helps to promote the inflow of labor force, and the significant improvement of the accessibility and accessibility of these public services may weaken the motivation of migration due to the attempt to obtain more and better public resources [4-5].

To sum up, the development of the Internet can improve the efficiency of job matching and broaden employment channels by reducing the cost of job search and expanding employment information resources, so as to reduce the difficulty of the labor force in finding jobs; Secondly, the development of the Internet drives the emergence of new industries and industries, creates new jobs and brings new employment opportunities to the labor force; Moreover, the development of the Internet can provide people with a platform for online communication and social networking, reducing the psychological cost of the floating population; In addition, the characteristics of Internet resource sharing promote the increase of human capital of labor force, improve working ability, obtain higher labor income returns, and thus reduce the willingness of outflow; Finally, the Internet technology improves the availability of public services for the floating population, and to a certain extent, curbs the outflow of labor. Therefore, this paper proposes research hypothesis 1.

Research hypothesis 1: The higher the level of urban Internet development, the lower the possibility of labor migration and willingness to flow.

In addition, in daily life, workers have different levels of proficiency in the operation and use of the Internet, and different levels of demand for the acceptance of Internet information, resulting in differences in the impact of the dividends brought by the development of the Internet on individual workers. Therefore, the impact of Internet development on the willingness of labor mobility may not be single, so research hypothesis 2 is proposed.

Research hypothesis 2: The impact of urban Internet development on labor mobility willingness is heterogeneous.

3. Data source, variable selection and descriptive statistics

3.1. Data sources

Combined with the core theme of this study, this paper involves the acquisition and processing of regional level data and micro individual level data respectively.

The data selected at the regional level are mainly from the China Urban Statistical Yearbook 2018, the National Bureau of Statistics, the statistical yearbooks of provinces and cities, and the data released by CNNIC. The micro data of the individual labor force in this paper is derived from the China Mobile Population Dynamic Monitoring Survey (CMDS). Based on the principle of traceability and meeting research needs, we applied to obtain the survey data of 2018. CMDS is a nationwide sampling survey organized by the China Health Commission, which collects data from floating population aged 15 or above in non local regions (counties and cities) on the principle of randomization. It covers 31 provinces (autonomous regions and municipalities directly under the Central Government) in China and places where the floating population is relatively concentrated in the Xinjiang Construction Corps. Nearly 200000 households are surveyed every year, and the survey covers basic information of sample families and individuals. The data are authoritative and representative in terms of mobility scope, flow direction, decision-making, work and social security, economic income and expenditure, living conditions, public services and family planning health. The mobility choice of individual labor force can well distinguish the difference of mobility choice of individual labor force with different characteristics by using micro survey data. At the same time, reverse causality can be avoided when studying the impact of Internet development and other urban characteristics on labor mobility. We selected the data of Volume A (Floating Population Questionnaire) in 2018, cleaned the answers to some questions of the sample about the "mobility and residence intention" of the questionnaire, and matched them with the data of cities above prefecture level (including prefecture level). In this paper, the sample of labor mobility is limited to the following conditions: (1) inter city mobility; (2) Flowing into the current city due to labor and business reasons; (3) The age is 15-64 years old. The number of labors meeting the above conditions is 124032 in total. In addition, due to the lack of variable values of some cities in urban characteristics, the cities constructed in this paper only include 290 cities at prefecture level and above. It is necessary to exclude the labors from other cities except these 290 cities. Therefore, the effective samples finally obtained in this paper are 119007 in total.

3.2. Variable selection

This paper mainly studies the mobility and residence intention of floating population from the perspective of urban Internet development, and examines whether the level of urban Internet development affects the mobility of labor force. Therefore, the setting of the explained variable labor mobility mainly refers to the "Mobility and Residency Intention" section of the CMDS questionnaire about "Do you intend to stay here for some time to come?" For the answer option of the question, the sample that answers "Yes" is assigned a value of "0", which means that the labor force chooses not to flow and continue to stay in the city; The other answers are assigned with a value of "1", which means that the labor force is willing to continue to move out of the city [6].

The setting of Internet development, the core explanatory variable, has not formed a unified standard for measuring the Internet development level, and the lack of Internet related data makes it difficult and challenging to measure the Internet development level. In addition, Internet development is a complex and comprehensive system, involving multiple dimensions. If a single indicator is used for measurement, such as Internet penetration rate, Internet penetration, number of websites, etc., it can only reflect some aspects of the size of Internet users or website resources, and there will be some limitations, leading to the lack of comprehensiveness and comprehensiveness of the indicators, thus the description of the development level of the Internet lacks authenticity. Therefore, based on the relevant research of many scholars, this paper selects the relevant indicators of the three dimensions of Internet scale level, relevant output and Internet development potential, and uses the principal

component analysis method to standardize the data of these three dimensions of indicators and then reduce the dimensions to obtain the Internet development index [7-9]. Specifically, the scale level of the Internet is measured by the number of Internet access users and mobile phone use among 100 people, the Internet related output is measured by the postal service income, and the Internet development potential is measured by the per capita salary of in-service employees and the number of information technology practitioners.

Referring to the practice of existing literature on labor mobility and migration, this paper also controls personal characteristics and urban environmental variables [10-14]. Personal characteristics mainly consider the age, gender, marriage, registered residence, residence, family size, education level, health status, etc. of the labor force. The setting of urban environment variables is based on the assignment of 0 and 1 from the situation of whether or not to enjoy medical security, which is directly related to personal migration decisions. Urban environment variables also take into account the urban level variables such as urban unemployment rate (urban registered unemployment/total urban population), the direct distance between the city and the provincial capital of the province where the city is located, and so on.

3.3. Descriptive statistics

Table 1 is a descriptive statistics of each indicator, which is the explained variable labor mobility (mlf), the core explanatory variable Internet development level (inter), the personal characteristics control variable age, age square (age2), gender, marriage, registered residence (reg), place of residence (town), family size (family), education level (edu) and health, Urban environment control variables: medical insurance (medtreat), unemployment rate (rou), distance from provincial capital (distance). Descriptive statistics list the sample number, average value, standard deviation, minimum value and maximum value of each indicator, and the specific values are shown in Table 1.

It can be seen from Table 1 that through the analysis and processing of data, a total of 119007 respondents' information was obtained. It can be seen from the mean, standard deviation, minimum and maximum values of the explained variables in the table that in the sample data of CMDS in 2018, about 17851 labor forces had the intention to continue to flow, accounting for about 15% of the screening samples. Next, focus on the core explanatory variable: Internet development. The average value of the urban Internet development level indicator is 0.66, and the standard deviation is 0.36. It can be seen that there are certain differences in the Internet development level of each city. In terms of individual characteristics, the average age of the labor force is 35.6 years old. Because the respondents of the questionnaire are migrant population, the average age is relatively young, which is in line with the current actual situation in China; The number of men and women in the sample is basically the same, with a little more male labor force; The average marital status of the labor force is about 0.8, which is close to 1, indicating that most of the people in the sample are still married; The average value of registered residence is close to 0, indicating that most of the labor force is rural registered residence population; In terms of the current residence of the labor force, most of the labor force in the survey sample currently lives in cities and towns, and only about 27% of the labor force lives in rural areas; The family size is about 3-4 people, which also shows that the general family size in the sample is small and medium-sized families with three to four people, which is basically consistent with the effect of the implementation of China's fertility policy; The average education level of the labor force is about 3.55, indicating that the education level of the labor force is still low. The education level of the vast majority of the labor force is in high school, vocational high school, technical secondary school or technical school and below. Among the labor force with education level in high school, vocational high school, technical secondary school or technical school, the majority of the labor force has junior high school diploma. Therefore, on the whole, there is still much room for improvement of the cultural level of our residents; The average of the health status of the labor force is about 3.88, and the standard deviation is about 0.36, which indicates that the health level of the labor force in the floating population is basically very good, and the difference between the samples is small. From the perspective of urban environment, the labor force participating in urban

basic medical insurance only accounts for about 11% of the total sample, and the coverage of medical insurance for migrant population needs to be further improved; The average unemployment rate is about 0.9, which is relatively low as a whole; The average distance between the respondent's city and the provincial capital is about 94 kilometers.

Table 1. Descriptive statistics

Variable type	Variable	The explanations of variable	Mean	Std
Dependent variable	mlf	Labor does not migrate=0, otherwise=1	0.150	0.360
Independent variables	inter	Measured by principal component analysis	0.660	0.090
	age	Survey year minus year of birth	35.60	9.790
	age2	Square of age	1363	742.7
	gender	Male=1, female=0	0.560	0.500
	marriage	Marriage existence=1, others=0	0.800	0.400
	reg	Non agricultural household registration=1, others=0	0.120	0.330
	town	Living in town=1, living in countryside=0	0.730	0.450
	family	Number of family members	3.080	1.210
		Below primary school=1, primary school=2, junior high school=3, senior high school=4, junior college=5, undergraduate=6, graduate=7	3.550	1.170
Control variable	edu			
	health	Very unhealthy=1, relatively unhealthy=2, relatively healthy=3, very healthy=4	3.880	0.360
	medtreat	Participate in the basic medical insurance for urban residents = 1, otherwise = 0	0.110	0.310
	rou	Registered urban unemployment/total urban population	0.900	0.670
	distance	The straight-line distance between the city and the provincial capital	94.14	128.5

4. Empirical design and basic regression results

4.1. Model setting

Focusing on the level of urban Internet development and labor mobility, this paper mainly discusses the level of urban Internet development from the individual level to empirically test whether the labor force that has entered the city chooses to flow. According to the setting of main variables, this paper selects linear probability regression equation to verify, and constructs a standard Probit model to examine the impact of urban Internet development on labor mobility. Specifically:

$$P(MLF_i = 1 | Inter, X) = \Phi(X'\beta) = \Phi(\alpha + \beta_1 Inter_i + \beta X + \varepsilon_i) \quad (1)$$

Among them, MLF_i represents the binary choice variable of labor mobility, $MLF_i=1$ represents the probability of labor mobility, Φ function conforms to the standard normal distribution, $Inter$ represents the comprehensive indicator variable of urban Internet development, X represents the control variable set of personal characteristics and urban environmental characteristics, and ε_i represents the random error term.

4.2. Basic regression analysis

Because the explained variable in this paper is a dummy variable with values of 0 and 1, we choose the Probit model for regression to conduct an empirical test on whether the level of Internet development affects cross regional labor mobility.

In this paper, control variables are independently introduced in the process of benchmark regression, and the reliability of the change detection results by observing the core explanatory variable - Internet development level index coefficient and significance. Table 2 shows the benchmark regression results of the impact of Internet development level on labor mobility, mainly showing the regression coefficient and marginal effect under the joint action of Internet development level and control variables. Among them, (1) is the regression coefficient result without adding control variables, (2) and (3) are the regression coefficient results after introducing individual level and urban environment control variables step by step, and (4) and (5) are the coefficients and marginal effects of re regression after considering all control variables.

It can be seen that whether the control variables are not considered, only the individual level control variables are considered, the regression coefficients of the urban level control variables are considered, or the estimation results of all control variables are considered, it shows that the level of urban Internet development has a significant inhibitory effect on labor mobility. This preliminary shows that compared with the labor force who plans to live locally, the development level of urban Internet attracts the labor force and reduces the probability of making mobility decisions. The results in column (5) show that the impact of the Internet development level on the inter regional labor mobility is negative, significant at the 1% significance level, and the marginal effect of the Internet development level is -0.1144, which means that for every unit of urban Internet development level increase, the possibility of workers planning to move out of the city will be reduced by 11.44%.

The results of columns (4) and (5) not only show the impact of urban Internet development level, but also show the impact of control variables on cross regional labor mobility. In terms of personal characteristics, the age and age square of respondents are significant at the level of 5%, the marginal coefficient of age is negative, and the marginal coefficient of age square is positive, indicating that age has a "U-shaped" relationship with the mobility choice of migrant population, that is, with the increase of age, the probability of migrant labor force choosing to leave their place of residence and continue to move decreases first and then increases, This may be because the floating population will increase their willingness to return to their hometown as they grow older, which is in line with the traditional Chinese idea of returning to their roots; The labor force with different education levels has different decision-making on mobility. The higher the education level is, the lower the willingness of motivation mobility is. This may be because the labor force with higher education level has more employment opportunities and higher salary treatment, so they are willing to stay in the city and do not choose to continue to flow; The larger the family size is, the lower the probability of labor mobility is. This may be because the larger the family size is, the higher the cost of continuing to flow will be; In addition, physical health, married status, living in cities and towns, and urban registered residence have a more obvious inhibitory effect on labor mobility. As far as the urban environment is concerned, the basic medical insurance for urban residents, the unemployment rate and the distance between the city and the provincial capital have all passed the significance test, showing a negative impact on labor mobility. It is worth noting that the coefficient and significance obtained by regression using gender as the control variable are not very clear.

Table 2. Basic regression results

Variable	Probit (1)	Probit (2)	Probit (3)	Probit (4)	Probit (5)
inter	-0.6230*** (-12.11)	-0.5347*** (-9.99)	-0.5552*** (-10.12)	-0.5065*** (-8.88)	-0.1144*** (-8.88)
age		-0.0298*** (-8.94)		-0.0298*** (-8.93)	-0.0067*** (-8.93)
age2		0.0004*** (9.17)		0.0004*** (9.15)	0.0001*** (9.15)
gender		-0.0145 (-1.58)		-0.0137 (-1.49)	-0.0031 (-1.49)
marriage		-0.2320*** (-14.72)		-0.2236*** (-14.14)	-0.0505*** (-14.16)
reg		-0.0478*** (-3.03)		-0.0393** (-2.49)	-0.0089** (-2.49)
town		-0.0777*** (-7.67)		-0.0761*** (-7.52)	-0.0172*** (-7.52)
family		-0.0769*** (-15.27)		-0.0776*** (-15.40)	-0.0175*** (-15.42)
edu		-0.1436*** (-30.12)		-0.1447*** (-30.31)	-0.0327*** (-30.44)
health		-0.0755*** (-6.12)		-0.0782*** (-6.32)	-0.0177*** (-6.32)
medtreat			-0.0428*** (-2.99)	-0.0591*** (-4.07)	-0.0134*** (-4.07)
rou			-0.0787*** (-10.82)	-0.0590*** (-7.93)	-0.0133*** (-7.93)
distance			-0.0001* (-1.91)	-0.0001** (-2.36)	-0.0000** (-2.36)
_cons	-0.6248*** (-18.28)	1.1075*** (13.32)	-0.5886*** (-15.56)	1.1641*** (13.69)	
Sample size	119007	119007	119007	119007	119007
Pseudo R ²	0.0015	0.0306	0.0027	0.0314	

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.3. Robustness check

The above empirical results have proved that the development level of the Internet has a significant inhibitory effect on labor mobility. In order to verify the robustness of this result, this paper will use the methods of excluding extreme values and replacing estimation methods to conduct the corresponding robustness test.

In order to ensure that the conclusion that the Internet development has an inhibitory effect on labor mobility is robust, and to avoid the possible adverse impact of extreme values on the regression results, this paper shrinks the Internet development level data on the 1% quantile, and re-regresses the processed data; Since the dependent variable in this paper is 0/1 binary, Cao Xing (2021) is referred to and logit model is used for estimation to test the robustness of the model [15]. In addition, the method of Hu Anning (2014) was used for reference to estimate the original model using the ordinary least squares (OLS) method [16]. In Table 3, columns (1) and (2) are the regression coefficients and average marginal effect coefficients estimated by Probit based on the index data of Internet development level after shrinking, respectively. Columns (3) and (4) are the regression coefficients

estimated by changing Logit and OLS measurement models on the role of Internet development level on labor mobility.

The results are as shown in Table 3. From the regression results of column (1) and column (2), it can be seen that the coefficient of Internet development level is consistent with that before the outliers are eliminated. The impact of Internet development level on labor mobility is still significantly negative, but the difference is that the regression coefficient and marginal effect become slightly larger, indicating that the sensitivity of labor mobility to Internet development level will increase slightly after excluding outliers; Marriage, registered residence, education and other sensitive variables also show similar laws. From the regression results of columns (3) and (4), the development level of the Internet still has a significant inhibitory effect on labor mobility after regression with different estimation methods, and this effect is significant at the level of 1%, which verifies the robustness of the benchmark regression.

In general, the regression results excluding extreme values and replacing estimation methods are basically consistent with the above regression results.

Table 3. Results of robustness test

Variable	Probit (1)	Probit (2)	Logit (3)	OLS (4)
inter	-0.7285*** (-10.46)	-0.1646*** (-10.45)	-0.9275*** (-8.73)	-0.1014*** (-8.22)
age	-0.0296*** (-8.88)	-0.0067*** (-8.89)	-0.0520*** (-8.87)	-0.0078*** (-9.65)
age2	0.0004*** (9.11)	0.0001*** (9.11)	0.0007*** (9.05)	0.0001*** (9.89)
gender	-0.0146 (-1.59)	-0.0033 (-1.59)	-0.0293* (-1.75)	-0.0033 (-1.56)
marriage	-0.2241*** (-14.17)	-0.0506*** (-14.19)	-0.3904*** (-13.76)	-0.0559*** (-15.16)
reg	-0.0349** (-2.20)	-0.0079** (-2.20)	-0.0790*** (-2.65)	-0.0043 (-1.29)
town	-0.0797*** (-7.85)	-0.0180*** (-7.85)	-0.1332*** (-7.28)	-0.0170*** (-7.23)
family	-0.0778*** (-15.46)	-0.0176*** (-15.47)	-0.1421*** (-15.36)	-0.0176*** (-15.58)
edu	-0.1433*** (-29.98)	-0.0324*** (-30.12)	-0.2623*** (-29.73)	-0.0308*** (-29.63)
health	-0.0772*** (-6.24)	-0.0174*** (-6.24)	-0.1317*** (-5.98)	-0.0192*** (-6.51)
medtreat	-0.0625*** (-4.30)	-0.0141*** (-4.30)	-0.1108*** (-4.16)	-0.0141*** (-4.30)
rou	-0.0559*** (-7.50)	-0.0126*** (-7.50)	-0.1087*** (-7.80)	-0.0130*** (-8.11)
distance	-0.0001*** (-3.49)	-0.0000*** (-3.49)	-0.0002** (-2.24)	-0.0000** (-2.14)
_cons	1.3052*** (14.71)		2.1744*** (14.33)	0.6667*** (33.53)
Sample size	119007	119007	119007	119007
Pesudo R ²			0.031	0.026

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5. Heterogeneity analysis

Due to the different working abilities and development needs of different labor groups, their sensitivity to the development level of the urban Internet also varies greatly. In the face of the rapid development of the Internet, migrant labor with different characteristics have different responses. Therefore, this paper further conducts a heterogeneity analysis. According to the results of benchmark regression and robustness test, registered residence, age, marriage and other personal characteristics have a significant impact on labor mobility. In order to explore the heterogeneity of individual characteristics of age and skill level affected by the Internet development level on urban labor mobility, this paper, referring to existing research, divides the age of 45 years old into young and middle-aged groups, divides the labor force with education level of high school and above into highly skilled labor force, and divides the labor force with education level of low school and below into low skilled labor force. Table 4 shows the regression results of Probit method for the impact of Internet development level on labor mobility at different ages and skill levels.

From the results of columns (1) and (2) in the table, it can be found that the regression coefficients of the urban Internet development level on the mobility of labor force at different ages are negative and significant at the 1% significance level, which indicates that the Internet development level has a significant inhibitory effect on the mobility of young and middle-aged labor force, and the higher the urban Internet development level, the smaller the probability of migration in cities. From the degree of its effect, the inhibition effect of the Internet development level in the young and middle-aged group is slightly stronger than that in the elderly group.

The results in Column (3) and Column (4) show that the mobility of labor with different skill levels is affected by the level of urban Internet development, and the regression results also show a similar law with the age group, that is, the mobility of highly skilled labor has a higher sensitivity to the level of urban Internet development, while the mobility of low skilled labor is relatively less sensitive. However, the regression results of low skilled groups still show the importance of urban Internet development level in labor mobility. That is to say, the benefits brought by the development of the Internet are very important for both highly skilled and low skilled workers.

Table 4. Results of heterogeneity analysis

Variable	Probit (1)	Probit (2)	Probit (3)	Probit (4)
inter	-0.1634*** (-4.52)	-0.1665*** (-9.56)	-0.1877*** (-9.49)	-0.1268*** (-5.29)
Control variable	Yes	Yes	Yes	Yes
Sample size	119007	119007	119007	119007
<i>Pseudo R</i> ²			0.031	0.026

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6. Conclusion and enlightenment

6.1. Conclusion

By building the Probit model, using the dynamic monitoring survey data of China's floating population and the macro data at the city level, this paper regresses the model, studies the impact of Internet development in 290 cities above prefecture level in China on the floating population's willingness to migrate, and tests the effectiveness of the results for robustness. After removing extreme values and replacing estimation methods, the results are regressed again, and the conclusion is still valid; In addition, the research will be further expanded to analyze the heterogeneity and empirically analyze the different effects of different individuals on the development of the Internet. The main conclusions are as follows: the impact of Internet development level on cross regional labor

mobility is negative, significant at the 1% significance level, and the marginal effect of Internet development level is -0.1144, which means that for each unit of urban Internet development level, the possibility of workers' planning to move out of the city will be reduced by 11.44%; Compared with the middle-aged and the old and the low skilled labor force, the middle-aged and the young and the high skilled urban labor force are more sensitive and responsive to the Internet, and are more likely to be encouraged by the development of the Internet and choose to stay in their cities.

6.2. Enlightenment

Based on the above conclusions, under the background of increasingly fierce talent competition, this study provides the following policy implications for improving the residence willingness of urban floating population and attracting and retaining talents in cities:

(1) We should improve the level of Internet development, promote balanced Internet development, improve quality and efficiency, and further play and enhance the role of Internet development in attracting urban floating population. The sound and healthy development of digital economy is the premise and foundation for cities to attract and encourage urban labor force to increase supply. Increase investment in the Internet. On the basis of strengthening the construction of new infrastructure, improve the penetration of the Internet into the three industries, and promote the Internet to release greater efficiency. At the same time, we should give full play to the advantages of the Internet in terms of high sharing and low cost, strengthen resource sharing and collaboration, reduce the imbalance of Internet development, and ensure and enhance the positive role of Internet development in retaining urban labor.

(2) The development of the Internet affects labor mobility differently from person to person, and differentiation policies should be implemented. Since the State Council issued the plan to promote the settlement of 100 million non registered residence population in cities in 2016, local talent settlement policies have been adjusted to varying degrees, and the "battle for talent" between cities has become increasingly fierce. Cities mainly formulate settlement and talent policies based on their own development needs and carrying capacity. The threshold of settlement and employment in first tier and some second tier cities is high and rising. Cities seldom consider the wishes and demands of fairness and urban labor force. In the process of policy formulation, we should take appropriate measures according to the willingness and response of different urban labor groups, and play the role of Internet development in restraining urban labor mobility. The research results show that young and middle-aged people and highly skilled urban labor force are more sensitive and responsive to the Internet, and are more likely to be encouraged by the development of the Internet and choose to stay in their cities. We can focus on the urban work willingness and actual work of these labor groups.

(3) For urban labors who have the desire and ability to work in cities but have not yet achieved stable employment, we can strengthen vocational skills training. At the same time, we can give full play to the advantages of urban Internet technology, build an employment information platform, reduce the communication costs between labor and employers, improve the matching efficiency between urban labor and jobs, and enhance the expectations of these workers for urban work and life, Attract labor force to stay in cities, so as to stabilize the supply of urban labor force.

Acknowledgements

The authors gratefully acknowledge the financial support from the National Natural Science Foundation of China's "Rules Compliance Behavior of Urban Residential Quarters in China and Its Impact on the Governance Mechanism".

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