

## An Empirical Study on the Determinants of Labor Entering Monopoly Industry in China's Urban Labor Market

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### Abstract

Industrial segmentation of the labor market is an important factor which causes the wage inequality in China's urban labor market. This paper aims to investigate the determinants which help people entering monopoly industry by building a logistic model using CHIP data. The results show that the workers' education, work experience and age are more helpful for labor entering monopoly industry in China's urban labor market. Compared with the local residents with the same human capital, the probability of the floating population entering the monopoly industry is much smaller.

**Key words:** Industrial segmentation; Urban labor market; Logistic model

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### INTRODUCTION

Before 1990, the pattern of segmentation in China's urban labor market was ownership segmentation. But since 1990, with the deepening of the reform of China's state-owned enterprises, the ownership segmentation began to weaken. At the same time, the government still took administrative monopoly policy in some important sectors which related to the country's economic stability. The profits of some monopoly enterprises and administrative institutions increased rapidly. The boundaries between the monopoly

industry and open industry gradually prominent and industrial segmentation formed. Industrial segmentation of the labor market is an important factor which causes the wage inequality in China's urban labor market.

In recent decades, analysis of the employment situation of different population with different gender, race and level of human capital has become a popular topic. Schultz, T. Paul (1982) analyzed the lifetime migration within educational strata in Venezuela. Smith, Tony E. and Zenou, Yves (1997) developed a two-sector model of urban employment which focuses on the formation of a secondary sector in response to a primary-sector demand shock. Their results showed that the optimal location of this (single-firm) sector is shown to give rise to a multicentric urban spatial structure. Ferrer, Ana and Green, David A. (2006) examine the impact of literacy on immigrant earnings and the sources of lower returns to education and experience among immigrants. They found that the native-born literacy distribution dominated that for immigrants. Among the less educated, literacy differences and differences in the returns to experience have similar effects on the earnings differential.

To analyze the determinants which help people entering monopoly industry, we will construct an empirical by using CHIP data. The paper is organized as follows: Section II introduces the logistic model used in the analysis. Section III discusses the CHIP data we used in the study, the estimation of the logistic model and the empirical results analysis. The final section concludes the paper.

### 1. EMPIRICAL METHODOLOGY

Much empirical research on labor's employment and its determinants involves estimating logistic model. We first assume  $y_i$  representing the employment status of worker  $i$ . When worker  $i$  is employed in monopoly industry, we have  $y_i = 1$ . When the work  $i$  is employed in open industry, we get  $y_i = 0$ . When the condition  $y_i = 1$  is met, there is

$y_i^* > 0^1$ , which means worker  $i$  is employed in monopoly industry. And we have:

$$y_i^* = a + \beta_1 x_{1i} + \dots + \beta_k x_{ki} + \xi_i$$

Where  $x_{1i} \dots x_{ki}$  is a vector of explanatory variables which represent the determinants that affect the worker entering the monopoly industry.  $\beta_1 \dots \beta_k$  are coefficient matrices,  $\xi_i$  is the corresponding disturbance vector. When  $\xi_i$  obey logistic distribution, we can obtain a logistic cumulative distribution function, and the model which describes the determinants of labor entering monopoly industry can be written as follow:

$$p_i = \frac{1}{1 + e^{-(a + \beta_1 x_{1i} + \dots + \beta_k x_{ki})}} = \frac{e^{a + \beta_1 x_{1i} + \dots + \beta_k x_{ki}}}{1 + e^{a + \beta_1 x_{1i} + \dots + \beta_k x_{ki}}}$$

Where  $p_i$  is the gross rate of labor  $i$  working in the monopoly industry. This is a nonlinear function. We can turn it into a linear function by setting odds and finally get a logistic model as follows:

$$\ln \frac{p_i}{1 - p_i} = a + \beta_1 x_{1i} + \dots + \beta_k x_{ki}$$

Where  $odds = \frac{p_i}{1 - p_i}$ , which is the gross rate of labor  $i$  working in the monopoly industry to open industry. As long as we have the observation values of  $x_{1i}, x_{2i}, \dots, x_{ki}$  and  $p_i$ , we can describe and analyze the probability of Occurrence Ratio of worker entering the monopoly industry under certain conditions.

**Table 1**  
**Screening of the Logistic Model**

Variable	Model 1	Model 2	Model 3	Model 4
Constant	-4.471*** 1088.420	-4.890*** 600.158	-4.891*** 600.280	-5.088*** 125.167
Education	0.302*** 1053.902	0.304*** 1062.637	0.303*** 1056.151	0.302*** 1042.567
Experience	0.025*** 98.228	0.011** 4.397	0.011** 4.326	0.011** 3.894
Age		0.017*** 8.420	0.017*** 8.308	0.017*** 8.498
Gender			0.015 0.047	
Hukou				9.471**
Hukou (1)				0.229** 4.145
Hukou (2)				0.089 0.488
Hukou (3)				-1.377 0.307
Overall Percentage	69.1	69.0	69.0	69.1
Chi-square	1308.721	1317.038	1317.145	1330.633
-2 Log likelihood	10917.602	10909.285	10909.178	10895.690
Cox & Snell R <sup>2</sup>	0.134	0.134	0.134	0.136
Nagelkerke R <sup>2</sup>	0.181	0.182	0.182	0.184
HL Test	26.405	21.201	23.290	22.138

<sup>1</sup>  $y_i^*$  represents the possibility of worker  $i$  entering monopoly industry.

## 2. EMPIRICAL STUDY

### 2.1 The Data

The data we used in the paper is provided by the CHIP (Chinese Household Income Project). The purpose of this project was to measure and estimate the distribution of income in both rural and urban areas of the People's Republic of China. Data were collected through a series of questionnaire-based interviews conducted in rural and urban areas in 1988, 1995, and 2002. Individual respondents reported on their economic status, employment, level of education, sources of income, household composition, and household expenditures.

To meet the needs of the analysis, we filter the survey samples based on the worker's age, job and residence before the empirical study. Then, we delete the samples which information are missing and finally get 9127 samples.

### 2.2 The Model

In order to get an appropriate model, we construct 4 different models as shown in Table 1. Model 1 is an initial model based on human capital theory, which only includes two independent variables. Model 2 to Model 4 are three different extended models of Model 1, into which we add several independent variables. From the estimated results of the models above, we can get the conclusion that Model 4 is the optimum model. So we choose Model 4 as the final model to estimate the determinants of labor entering monopoly industry in china's urban labor market.

When we use forward stepwise regression method to re-estimate the model, we also can get the optimum model

just the same as Model 4. Table 2 shows the statistical indicators of score test, which indicate Model 4 is the best model to explain the changes of the dependent variable.

**Table 2**  
**Score Test of Logistic Model in Stepwise Regression**

	Variable	Model log likelihood	Change in -2 log likelihood	df	Sig.
Step 1	Education	-6113.162	1208.353	1	0.000
Step 2	Age	-5508.985	104.237	1	0.000
	Education	-6112.251	1310.769	1	0.000
Step 3	Hukou	-5456.866	14.110	3	0.003
	Age	-5500.004	100.385	1	0.000
Step 4	Education	-6089.867	1280.112	1	0.000
	Hukou	-5454.642	13.595	3	0.004
	Age	-5452.044	8.398	1	0.004
	Education	-6089.219	1282.747	1	0.000
	Experience	-5449.811	3.932	1	0.047

### 2.3 The Empirical Results Analysis

There are four independent variables in Model 4, which include labor's age, education, experience and Hukou. Table 3 shows the parameter estimation results of Model

4. The parameters of education, experience and age are positive, which indicate that with the increase of labor's education, experience and age, the ratio of workers entering the monopoly industry gradually improve.

**Table 3**  
**Parameter Estimation Results of Logistic Model**

Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Constant	-5.088	0.455	125.167	1	0.000	0.006		
Hukou			9.471	3	0.024			
Hukou (1)	1.377	0.676	4.145	1	0.042	3.968	2.053	10.923
Hukou (2)	0.089	0.488	0.034	1	0.855	1.093	0.420	2.844
Hukou (3)	-0.408	0.589	0.480	1	0.488	0.665	0.210	2.109
Age	0.017	0.006	8.498	1	0.004	1.017	1.006	1.028
Education	0.302	0.009	1.043E3	1	0.000	1.353	1.328	1.378
Experience	0.011	0.005	3.894	1	0.048	1.011	1.000	1.021

The coefficients of labor's education, experience and age are 0.302, 0.011 and 0.017 respectively, which means one additional year of workers' education, experience and age will allow the occurrence rate of workers entering the monopoly industry change 1.353 times, 1.011 times and 1.017 times. The coefficients are the Adjusted Occurrence Rate (AOR) of education, experience and age. Obviously education is the most significant factor for workers to enter the monopoly industry.

Hukou is a multi-categorical variable which on behalf of workers' household registration attributes. Hukou (1), Hukou (2) and Hukou (3) represent local citizens, local

migrant workers, and foreign citizens in the labor force respectively. As a set of variables, they must be included or excluded from the model together. The estimation results show the Wald statistic of Hukou is significant, while the Wald statistic of Hukou (2) and Hukou (3) are insignificant. The results illuminate that the Occurrence Rate of local citizens entering the monopoly industry is 3.968 times that of foreign migrant workers. While there is little difference on the ratio of worker entering the monopoly industry between the local migrant workers, the foreign citizens and the foreign migrant workers.

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## CONCLUSION

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To analyze workers' employment condition in China's urban labor market, this paper construct four logistic models to filter out the best model which can describe the determinations of workers' industry. And we find that the Model 4 which includes 4 independent variables is the optimum model. The empirical analysis results indicate as follows:

First, with the increase of labor's education, experience and age, the ratio of workers entering the monopoly industry gradually improve. Second, education is the most significant factor for workers to enter the monopoly industry. And third, the Occurrence Rate of local citizens entering the monopoly industry is 3.968 times that of foreign migrant workers. But the local farmer workers, foreign citizens and foreign farmer workers, which are different groups in floating population, do not have significant differences on the probabilities of entering the monopoly industry.

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## REFERENCES

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- [1] Becker, G. S., & Chiswick, B. R. (1996). Education and the Distribution of Earnings. *The American Economic Review*, 56(1/2), 358-369.
- [2] Cohen, Goldner S., & Paserman, M. D. (2011). The Dynamic Impact of Immigration on Natives' Labor Market Outcomes: Evidence from Israel. *European Economic Review*, 55(8), 1027-1045.
- [3] Ferrer, A., & Riddell W. C. (2008). Education, Credentials, and Immigrant Earnings. *Canadian Journal of Economics*, 41(1), 186-216.
- [4] Lindbeck, A., & Snower, D. J. (1986). Wage Setting, Unemployment, and Insider-Outsider Relations. *The American Economic Review*, 76(2), 235-239.
- [5] Lynch, L. M. (1989). The Youth Labor Market in the Eighties: Determinants of Re-Employment Probabilities for Young Men and Women. *The Review of Economics and Statistics*, 71(1), 37-45.
- [6] Mincer, J. (1958). Investment in Human Capital and Personal Income Distribution. *Journal of Political Economy*, 66(4), 281-302.
- [7] Mincer, J. (1970). The Distribution of Labor Incomes: A Survey with Special Reference to the Human Capital Approach. *Journal of Economic Literature*, 8(1), 1-26.
- [8] Prentice, R. (1976). Use of the Logistic Model in Retrospective Studies. *Biometrics*, 32(3), 599-606.
- [9] Schultz, T. P. (1982). Lifetime Migration Within Educational Strata in Venezuela: Estimates of a Logistic Model. *Economic Development and Cultural Change*, 30(3), 559-593.
- [10] Smith, T. E., & Zenou, Y. (1997). Dual Labor Markets, Urban Unemployment, and Multicentric Cities. *Journal of Economic Theory*, 76(1), 185-214.
- [11] Solomon William, P. (1981). Occupational Self-Selection: A Human Capital Approach to Sex Differences in Occupational Structure. *The Review of Economics and Statistics*, 63(1), 60-69.