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Trade Liberalization and Chinese Firms' Employment Scale

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Abstract. This paper examines the effect of trade liberalization on firms' employment scale on the basis of the sample of Chinese industrial firms. The results show that trade liberalization enlarges the firms' employment scale. The paper also finds that the effect of trade liberalization differs according to the industry, region and firm's ownership. Specifically speaking, trade liberalization enlarges the employment scale of the firms located in the eastern and middle area but reduces the employment scale of the firms located in the western area; although trade liberalization has significant positive effect on firms in industries with different resource intensity, it has the highest effect on the labor intensive industry; trade liberalization enlarges the employment scale of the collective and foreign firms but reduces the employment scale of the government owned firms.

Introduction

Trade liberalization has become the important incentive to the economic growth, many scholars have proved that trade liberalization improves the economy efficiency through resources reallocation. However, does trade liberation play positive role concerning employment? Trade liberalization provides conveniences to inputs imports and takes replace effects on labor forces, while takes scale effects through intensifying competition faced by the final goods, this effect can increase the demand for the labor forces. Therefore, the effect of trade liberalization on employment is uncertain.

China has enforced trade system reforms focusing on tariff and non-tariff reduction, especially after entering into the WTO, China propels trade liberalization reform in accordance with the WTO rules and commitments to WTO, in 2015, China's average tariff reduced to 9.8%, at the same time, non tariff barriers are also reduced, many export duties including agricultural tariff has been reduced. Trade liberalization accelerates the economic prospects, total import and export volume amount to USD3958.6 billion in 2015 and occupy the 10.5% of the world trade volume(The data are calculated by the author using the data from WTO.). However, trade development of China does not relieve its employment pressure, the data from the China Statistic Bureau indicate that China's unemployment has not obvious declining tendency.

As the largest labor-intensive developing nation, how dose China's trade liberation impact its employment? The exiting studies mainly analyzed it from the industry level. With the foundation of the Melitz Model, firm has become the focus of the international trade. Comparing with the studies on the effect of trade liberalization on firm's productivity and wage, the study on the effect of trade liberalization on employment is scarce. This paper studies the effect of China's trade liberalization on its employment under the framework of firm heterogeneity. Specifically speaking, the paper takes the China's entering into the WTO in 2001 as the cutoff point (After China's entering into the WTO in 2001, China has accelerated trade liberalization, the paper takes the year 2001 as the cutoff point and compares the change of the firm's employment scale can reflect the effect of trade liberalization on employment.),dividing the Chinese industrial data 1999-2007 into two periods:1999-2001 and 2002-2007 and analyzes the effect of trade liberalization on employment through comparing the change of the firm's employment scale of this two periods. In addition, the paper also analyzes whether the effect of trade liberalization on employment differs with the firm's location, industry and ownership.

Literature Review

There are some literatures that study the effect of openness on labor markets and firms, including Melitz (2003), Davidson et al.(2008), Egger and Kreickemeier (2009), Helpman et al.(2010), Davis and Harrigan(2011), Felbermayr et al.(2011), Dix-Carneiro(2013), Fajgelbaum (2013), Cosar, Guner and Tybout(2013), Xi Yanle and Wang Kaiyu(2015), Mao Qilin and XuJiayun(2016). Among these literatures, this study is most relevant to the following literatures:

Cosar, Guner and Tybout(2013) explored the combined effects of reductions in trade frictions, tariffs and firing costs on firm dynamics, job turnover, and wage distributions. They found that integration with global product markets has increased both average income and job turnover in Colombia.

Flanagan and Khor(2012)compared the evolution of working conditions and labor rights in Asian and non-Asian economies in the late 20th and early 21st century and analyzed the relationship between labor conditions and international trade and investment flows. They found no evidence that persistent differences in labor conditions between Asia and the rest of the world can be explained by differences in growth and international trade. They also found no evidence that countries with poor labor conditions attract disproportionate flows of foreign direct investment. Instead, FDI flows seem mainly influenced by considerations of market size, investment risks, and the share of trade in GDP.

Davidson, Heyman and Matusz(2011)focused on the ability of the labor market to correctly match heterogeneous workers to jobs within a given industry and the role that globalization plays in that process. Using matched worker-firm data from Sweden, they found strong evidence that openness improves the matching between workers and firms in industries with greater comparative advantage.

Helpman, Itskhoki and Redding(2010) reviewed a new framework for analyzing the interrelationship between inequality, unemployment, labor market frictions, and foreign trade.This framework emphasized firm heterogeneity and search and matching frictions in labor markets. It implied that the opening of trade may raise inequality and unemployment, but always raises welfare. Unilateral reductions in labor market frictions increase a country's welfare, can raise or reduce its unemployment rate, yet always hurt the country's trade partner.

QilinMao and JiayunXu(2016) analyzed the impact of input trade liberalization on Chinese manufacturing firms' job dynamics. The results show that input trade liberalization has positive influence on firms' net growth of employment through "improving job creation" and "reducing job destruction".

Yanle Xi and KaiyuWang (2016) used the manufacturing firms in china from1998-2007 to present evidence of the impact of output and input trade liberalization on job flows of heterogeneous enterprises. The empirical results showed that the effect of trade liberalizations on firms' job flows varies with the productivity.

From the literature review, it can be found that the previous studies have the following limitations: first, the relevant studies focusing on the firm level are scarce. Second, although China expedites trade liberalization, the developing level and opening degree vary among regions and industries, the employment scale of the firms is unevenly affected by the trade liberalization. The previous literatures often neglect it. Third, Does the effect of trade liberalization on employment differ with the firm's ownership and capital sources? The relevant studies need to be deepened.

Data and Model

Data Source and Processing

The data used in the paper come from the China industrial firm database(1999-2007). This database is comprised of all the state-owned and non stated but revenue exceeding 50 million firms. This database provides more than one hundred variables. Although this database has enormous samples, abundant statistic indexes and long duration, it has some defects, such as measurement errors, index errors and abnormal data. To ensure the reliability of the empirical test, the paper processes the data

as follows.

Firstly, the quantities of the firm in each year are different because of firms' bankruptcy or reorganization. The paper identifies the 4859 firms which operate continually during the whole sample period. Secondly, the paper deletes the firm samples which have deficient or abnormal data. After the above processing, the paper gets 3948 firms.

Model and Variables

Definition of the Variables

The paper uses the firm's average employees as the explained variable. The paper takes the year 2001(it's the year in which China entered into the WTO) as the cutoff pointand sets up the dummy variable WY as the explanatory variable, if the data fall within the period of 1999-2001, WY=0, if the data fall within the period of 2002-2007, WY=1. Based on the previous studies, the paper sets up the following controlled variables: 1) total factor productivity (lnTFP). It is calculated based on C-D production function using Solow surplus. 2)firm's average wage(lnwage). It is defined as the total amount of the firm's payable wage and the welfare divide the firm's average employees .3)firm's capital intensity(lnkl). It is defined as Annual Average Balance of Net Value of Fixed Assets divides the firm's average employees.4)firm's financial standing(lnfinance). It is defined as firm's liabilities divides the firm's assets. 5)proportion of the firm's new product(newsale). It is defined as the proportion of the new product in the firm's total production.

In addition, because the firm's employment scale will be effected by the firm's location, industry and ownership, the paper classifies the firms into eastern firms, middle firms and western firms according to the firm's location, classifies the firms into labor intensive, capital intensive and technology intensive according to the firm's industry code (The classification of the location and industry can be found in the paper written by Chunyan Zhao in Sep. 2013, published in the journey of International Trade, page 113.), classifies the firms into government owned firms, collective firms and foreign capital firms according to the proportion of the government capital, collective capital and foreign capital in the firm's total paid-in capital.

Model

The purpose of this paper is to study the impact of trade liberalization on the employment scale of the Chinese firms, based on the previous relevant literature, the paper sets up the following empirical model:

$$\ln labor_{jt} = \alpha + \beta_1 WY_{jt} + \beta_2 CV_{jt} + \varepsilon_{jt} \quad (1)$$

$\ln labor_{jt}$ is the explained variable, WY_{jt} is the explanatory variable, CV_{jt} is the controlled variable, ε_{jt} is the random error term, subscriptj and t represent the firm and year respectively.

Model Estimation and Analysis

The paper conducts the OLS estimation and panel FE estimation, the results are listed in the table 1. The estimates in the column (2) and (4) of the table 1 just take into account the effect of entering into the WTO on the firm's employment scale regardless of the controlled variables, the results show that entering into the WTO has positive effect on firm's employment. Then, the paper adds controlled variables, the results are shown in the column(3) and (5). Comparing with the results regardless of the controlled variables, the significance of WY increased 1% both in the OLS and the FE estimates. It indicates that after controlling other elements which affect the firm's employment scale, the positive effect of entering into the WTO on the firm's employment is larger. The high consistency between OLS and FE estimates also shows that the estimated results of this study are robust.

The reasons which trade liberalization enlarges firm's employment scale are as follows:

First, trade liberalization increases the firm's export. The tariff and non-tariff barrier decrease brought by trade liberalization enables the high increase of the Chinese export firms, especially the

labor-intensive firms, this in turn increases the production scale and demand for the labors.

Second, trade liberalization accelerates the FDI. It is an indisputable fact that FDI plays a positive role in the enlargement of the Chinese employment. After China entered into the WTO, China further relaxed the limitations on the inflow of the foreign capital, the more and more fair and transparent investment environment expedites the increase of the foreign investment, it has brought a positive effect on the employment.

Third, trade liberalization fosters the fair market competitive environment, Chinese government policies more and more inclines to the firms which have good performances and the firms which can bring high social efficiencies. The firms losing competitive advantages will be weeded out. The survival of the fittest optimizes the resource allocation and propels the attractiveness of the competitive firms to the labors.

The paper then turns view to the controlled variables. The effect of total factor productivity on employment is negative and significant on the 1% level. The previous studies have confirmed that trade liberalization can improve the firm's productivity, the improvement of the productivity will cause the replacement of the capital to the labor, this effect decreases the demand for labors.

Firm's wage has significantly negative effect on employment. The reason is that wage level represents the labor costs, firm can reduce costs by cutting down the labor's amount. When the wage is high, the cost of labor force occupies the large proportion of the firm's cost, firm will reduce its cost by laying off the workers.

The estimated coefficient of the capital intensity is significantly negative at the 1% level, it indicates that capital intensity has significant negative effect on firm's employment. Because the firms with high capital intensity have high fixed costs, especially when the increase of the capital intensity mainly comes from the updating of the firm's machinery, the demand of the firms for the labor forces will decline.

The firm's financial standing has positive effect on employment, it indicates that the firms with good financial standing have large demand for labors, because good financial standing can enable the firms to pay the costs needed to enlarge firms' scale.

The firm's new product proportion has significant positive effect on firm's employment, it indicates that the more larger proportion of the new product is in the firm's total production, the more larger the firm's scale is. The increase of the firm's new product proportion states that firm accelerates the upgrading of the machinery, technology and innovation, because of the replacement of the technology and machinery on the labors, therefore, the firm's employment scale will decrease.

Table 1: The estimates of the trade liberalization on the firms' employment scale

Variables	OLS		FE	
WY	0.0265**(0 .0134)	0.0257***(0.0131)	0.0086* (0.0048)	0.1302*** (0.0049)
lnTFP		-0.2207**(-0.0070)		-0.1216*** (-0.0048)
lnwage		-0.1190***(-0.0119)		-0.0736*** (-0.0063)
lnkl		-0.0698***(-0.0056)		-0.2303*** (-0.0042)
lnfinance		0.1527***(0.0101)		0.0192*** (0.0060)
newsale		0.7182***(0.0318)		0.2511*** (0.0164)
Constant term	4.9470***(0.0289)	5.6982***(0.0339)	5.1372*** (0.0067)	6.8127*** (0.0240)
observation	30872	30872	30872	30872
Hausman test (P value)	0.0000			

Notes: ***significant at 1%, *significant at 10%.

Extensive Analysis of the Effect of Trade Liberalization on Employment

Extension I: Regional Differences of the Effect of Trade Liberalization on Employment

The column (1) –(3) of the table 2 show the results of the panel data FE test of the different regions. It can be found that trade liberalization has significant positive effect on the firms located in the eastern and middle areas while has significant negative effect on the firms located in the western area. After comparing the coefficient, it can be found that the effect of trade liberalization on the employment scale of the eastern area is larger than the middle area. The above results indicate that the effect of trade liberalization on the firm's employment scale is significantly different. The reason is that the economic development level and wage level of the eastern and middle areas are higher than which in the western area, because of the geographic advantages, trade liberalization has further strengthened the above advantages so that more labor forces can be induced. The openness level of the eastern area is higher than the western area, furthermore, the western area is limited by its economic development level, its firms develop slowly, the educational level and career prospect cannot achieve the same level as the eastern and middle areas, therefore, its attractiveness to the labor forces is obviously less than the eastern and middle areas.

Extension II: Industrial Differences of the Effect of Trade Liberalization on Employment

To study whether the effect of trade liberalization on the firm's employment scale is different with the industry in which the firm locates, the paper divides the firms into labor intensive, capital intensive and technology intensive according to its factor intensity. The results of the panel data FE test are shown in the column (4)-(6) of the table 2. The results show that trade liberalization has positive effects on the three industries and the effects are significant at the 1% level. It needs to be emphasized that the effect of trade liberalization on the employment scale of the three industries varies to some degree. The effect on the labor intensive industry is the largest, then is the technological industry, the least is the capital intensive industry. This result coincides with the comparative advantage of China in the global specialization. Because the large proportion of the Chinese firms belong to the labor intensive industry, trade liberalization further accelerates the trade of this industry so that the demand for the labor force can be increased.

Extension III: Ownership Differences of the Effect of Trade Liberalization on Employment

The theoretical and empirical studies on the heterogeneous firms approved that the firm with different ownership is different with the employment scale, productivity and capital intensity. The paper classifies the sample firms into state owned firms, collective firms and foreign capital firms and estimates the effect of liberalization on the employment scale of the firms with differentownership, the results are listed in the table 2, column (7)-(9). It can be found that the effect of trade liberalization on the employment is different with the firm's ownership, the effect of trade liberalization on the collective firms and the foreign capital firms is significantly positive, but for the state owned firms, this effect is significantly negative. The reason is that the most of the state owned firms belong to monopoly or oligarch, in addition to the subsidies and policy inclination given by the government, the state owned firms compete in the non-market environment, they can not share the benefits brought by trade liberalization. It also can be found that the effects of trade liberalization on foreign owned firms is larger than the collective firms, because with the further development of trade liberalization, the profit-seeking feature of the capital makes more and more foreign capital to inflow into China to take advantage of the comparative advantage of Chinese labor forces, it's no doubt that lots of opportunities can be brought to the labor forces and enlarge the employment scale of the foreign capital firms.

Conclusions

Using the Chinese Industrial Firm Database, this paper compares the change of the firm's employment scale by controlling the firm's characteristic variables and classifies the firms as the firms' location, industry and ownership. The paper draws the following conclusions:

First, trade liberalization significantly enlarges the firm's employment scale. This conclusion is robust after deleting the abnormal samples, differentiating the firm's trade status and capital sources.

Second, the effect of trade liberalization on firm's employment scale varies with the region, industry and ownership of the firms .Trade liberalization enlarges the employment scale of the firms located in the eastern and middle areas but reduces the employment scale of the firms located in the western area; although trade liberalization has significant positive effect on firms in industries with different resource intensity, it has the largest effect on the labor intensive industry; trade liberalization enlarges the employment scale of the collective and foreign firms but reduces the employment scale of the state owned firms.

Table 2: Extensive Analysis of the Effect of Trade Liberalization on Employment

variable	location			industry			ownership		
	east (1)	middle (2)	west (3)	Labor intensive (4)	Capital intensive (5)	Technology intensive (6)	Government owner (7)	Collective (8)	Foreign capital(9)
WY	0.1328***	0.0705***	-0.0466***	0.1492***	0.0976***	0.1308***	-0.0349***	0.1793***	0.1929***
	-0.0049	-0.0212	(-0.0076)	-0.0074	-0.0092	-0.0111	(-0.0099)	-0.0076	-0.0083
lnTFP	-0.1184***	-0.1832***	-0.1128***	-0.1823***	-0.0783***	-0.1566***	-0.0134*	-0.1975***	-0.1558***
	(-0.0049)	(-0.0203)	(-0.0058)	(-0 .0084)	(-0.0084)	(-0.0108)	(-0.0075)	(-0.0091)	(-0.0096)
lnwage	-0.0733***	-0.0648***	-0.0506***	-0.0672***	-0.1296***	-0.0088	-0.1485***	-0.0208*	-0.0441***
	(-0.0065)	(-0.0226)	(-0.0069)	(-0.0098)	(-0.0116)	(-0.0139)	(-0 .0113)	(-0.0113)	(-0.0114)
lnkl	-0.2366***(-0.0043)	-0.1161***	-0.1341***	-0.2126***	-0.2481***	-0.2457***	-0.3374***	-0.1890***	-0.1984***
		(-0.0162)	(-0.0047)	(-0 .0066)	(-0.0078)	(-0.0094)	(-0.0088)	(-0.0067)	(-0.0077)
lnfinance	0.0242***	0.0676***	0.0063	0.0288***	0.0118	0.0705***	0.01	0.0124	0.0977***
	-0.0062	-0.0247	-0.007	-0.0094	-0.0122	-0.0135	-0.0117	-0.0108	-0.0101
newsale	0.2625***	0.0941	0.0383***	0.2546***	0.3116***	0.2113***	0.1995	0.2538***	0.1628***
	-0.0168	-0.0793	-0.0021	-0.0304	-0.0293	-0.0293	-0.0391	-0.0235	(0 .0274)
constant	6.8035***	6.9708***	6.535***	7.0426***	6.7089***	6.9013***	7.275***	6.6659***	7.0035***
	-0.0249	-0.0888	-0.0278	-0.0398	-0.0441	-0.0557	-0.0446	-0.0408	-0.0521
Hausman Test P value	0	0	0	0	0	0	0	0	0
observations	20252	7526	3094	11723	8783	7179	6720	13156	9287

Notes: ***significant at 1%, **significant at 5%, *significant at 10%.

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References

[1] Cosar, A. K., N. Guner, and J. Tybout, Firm Dynamics, Job Turnover, and Wage Distributions in an Open Economy, NBER Working Paper , 2013.

[2] Davidson, C., F. Heyman, S. Matusz, F. and S. C. Zhu, Globalization and Imperfect Labor Market Sorting, Research Institute of Industrial Economics Working Paper, 2011.

[3] Davis, D. R., J. Harrigan, Good Jobs, Bad Jobs, and Trade Liberalization. Journal of International Economics, 84.1 (2011): 26-36.

[4] Egger, H, Kreickemeier U., Firm Heterogeneity and the Labor Market Effects of Trade Liberalization. International Economic Review,50.1(2009): 187–216.

[5] Felbermayr, G., J. Prat and H-J Schmerer, Globalization and Labor Market Outcomes: Wage Bargaining, Search Frictions, and Firm Heterogeneity, IZA Discussion Paper, 2008.

[6] Flanagan, R. J. and N. Khor, Trade and the Quality of Employment: Asian and Non-Asian Countries, Asian Development Bank Working Paper, 2012.

[7] Helpman, E., O. Itskhoki, Labor Market Rigidities, Trade and Unemployment, Review of Economic Studies, 77.3(2010):1100-1137.

[8] Melitz, M.J., The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity, Econometrica, 71(2003): 1695-1725.

[9] Yan-Le XI and Jiang-Man YU, The Influence of Exporting Trade on Firm's EmploymentScale----The Empirical Research Based on Chinese Micro-enterprise Databasefrom 2000-2007, Journal of Shanxi University of Finance and Economics, 2(2016):14-24.(In Chinese)

[10] Qi-Ling MAO and Jia-Yun XU, Input Trade Liberalization and Manufacturing Job Dynamics, Economic Research Journal, 1(2016):69-80.(In Chinese)