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International Trade and Urban-Rural Disparity in China

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Abstract　This paper studies the impact of international trade on urban-rural income disparity in China. Using cross-province panel data of China (1992–2003), we investigate the effects of international trade on employed income and total income distribution. In addition, we check whether these effects change regionally. The results show that trade significantly increases urban-rural total income disparity in the eastern coastal region but seldom works in other regions. Moreover, trade has no significant effect on employed income disparity.

JEL classification: C33, F19, O18, O19, O53

Key words　International Trade, Urban-rural income disparity, Employed income, China

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概要　本論文は貿易開放が中国の都市・農村間の格差にどのような影響を与えるかと分析した。中国の省別パネルデータ（1992—2003）を用いて実証分析した結果，国際貿易は東部沿海地域の都市・農村間の総所得格差の拡大に正の影響を与えるが，内陸部の都市・農村間の所得格差に有意な影響を与えない。さらに，国際貿易は都市・農村間の給与所得格差に影響を与えないことが明らかになった。

キーワード　国際貿易，都市・農村間所得格差，給与所得，中国

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1. Introduction

China has experienced rapid growth since the launching of economic reforms in the late 1970s. International trade has played a vital role in this process. However, the benefits of growth are not evenly shared. Income distribution has become increasingly unequal. The Gini coefficient burgeoned from 0.288 in 1981 to 0.47 in 2003 (World Bank, 1997, 2004), and hit a peak of 0.491 in 2008 (China daily, 2013). The rise in overall inequality in China is influenced by intra-urban inequality, intra-rural inequality, but is primarily driven by urban-rural disparity. The World Bank (1997) concludes that the intra-province urban-rural income gap is responsible for one third of overall inequality in 1995 and one-half of the increase in inequality since 1985. Ravi and Zhang (1999) show that during 1983–1995 urban-rural disparity contributes to 71%～78% of overall inequality in China. Similar conclusions are reported in researches that investigated particular provinces. Yang (1999) uses household survey data and finds that from 1986 to 1994, the urban-rural disparity indicates an 82% change in overall income inequality in the Jiangsu province, and virtually a total change in overall inequality in the Sichuan province. Yao and Zhu (1998) find that the urban-rural disparity accounts for 47%～51% of overall income inequality in Sichuan and Liaoning from 1988 to 1990. Treiman (2011) says that the urban-rural gap in well-being in China has been likened to the "difference between heaven and earth".

The present study focuses on urban-rural disparity by investigating the effects of international trade on income distribution. While there are numerous studies concerned with the relationship of trade liberalization and inequality, most of them concentrate on how trade might affect countries economic growth in different degrees, due to their different comparative advantages. For within-country study, most research focuses on how trade affects inter-sector wage inequality or intra-regional inequality as seen in the Gini or Theil index. Attempts to measure the effects of trade on inter-regional inequality within a country are few in number. Wei and Wu (2001) use cross-city data (1988–1993) to present evidence of a negative

relationship between trade and urban-rural per capita GRP (Gross Regional Product) disparity in China. However, since inequality is measured by urban-rural relative productivity, the Trade-Inequality problem is similar to cross-country studies that expect trade liberalization to have an unbalanced impact on economic growth. Therefore, without controlling urban and rural trade values separately (although this is due to the limitation of data), the study may lead to bias.

Noting that almost all the existing empirical studies analyze the impact of trade on inter-area inequality in terms of production following the "Trade-Growth-Inequality" flow, it can be said that little light is shed on distribution process. Investigating trade-inequality from the distribution side is meritorious in overcoming problems in traditional studies that hold that trade and productivity are endogenous. We expect trade to influence income distribution through effecting employment and wage rate. Looking at the sum of these two effects, the sign of the trade effect on urban-rural disparity becomes an empirical question.

Using cross-province panel data (1992–2003) in China, we examine the effect of trade on urban-rural employed income disparity and total income disparity. Furthermore, we check whether these effects change regionally or over time. The estimate results indicate that: (1) Trade expansion has little effect on urban-rural employed income disparity but increases urban-rural total income disparity in the eastern coastal region. (2) International trade does not work on urban-rural income disparity in the central and western regions. (3) These results are unchanged even after time differences are controlled.

The remainder of this paper is as follows. Section 2 analyzes the distributional effect of trade. Section 3 outlines the empirical model. Section 4 describes the data. Section 5 presents the estimation results of this data. Section 6 offers further discussion, and section 7 conclusions.

2. The Distributional Effects of International trade

2.1 Wage effects

The traditional Heckscher-Ohlin Samuelson theory supplies rationale for the

relationship between international trade and wage inequality. In relation to urban-rural income disparity, we focus on the following two effects:

(1) ***The effect on skilled-unskilled wage differentials.*** Ample evidence in China shows that trade raises the relative wage of skilled labor as opposed to unskilled labor, because trade liberation upgrades technology, improves skills and increases the competitiveness of local firms in the international market (Wu, 2000; Thomas and Fan, 2004). The share of skilled workers in urban areas is larger than that in rural areas. Hence we guess trade would increase urban-rural disparity in this sense.

(2) ***The effect on nonagricultural-agricultural relative wage.*** International trade in China is centered on manufactured goods (over 80% for both exports and imports). Moreover, as development policy has been biased in favor of manufacturing, manufactured goods in China enjoy more benefits of relatively higher trade barriers than agriculture (Zhai and Wang, 2002). As a consequence, trade is likely to increase the nonagricultural/agricultural wage ratio and induce an increase in urban-rural income disparity in turn.

2.2 Employment effects

There are two effects of trade on employment that are considered to influence urban-rural income disparity:

(1) ***The effect on relieving unemployment.*** China holds the comparative advantage in labor-intensive industries, therefore trade liberalization favors labor. However, this effect on urban-rural disparity is ambiguous. It depends on the location of the export-oriented enterprises and skill requirement.

(2) ***The effect on off-farm employment.*** International trade plays a significant role in facilitating industrialization in China, and in turn promotes the transfer of agricultural labor into the industrial sector. As we all know, agricultural

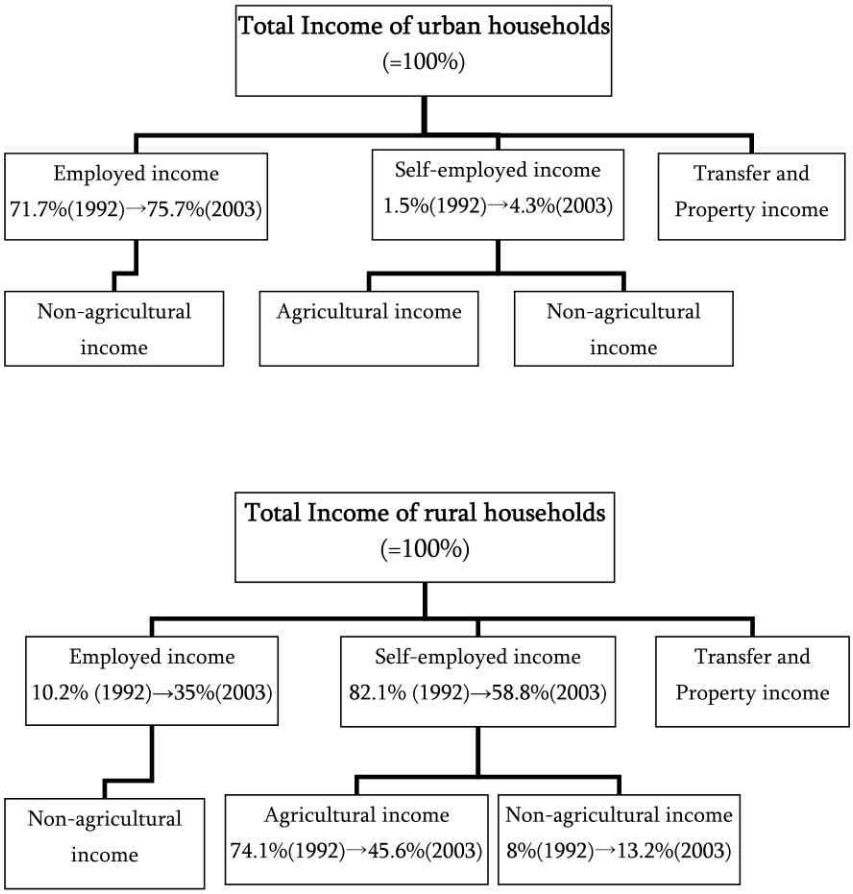
labor in urban areas is not concentrated, it can be said that off-farm employments mostly occurs in rural regions. There are two types of off-farm movement in rural area: rural-to-rural movement, which consists mostly of movement to local rural township and village enterprises (TVEs), and rural-to-urban migration. Here we must note that income and labor force is calculated by registration, and that the income of rural migrant labor is counted in rural income. Labor movement from the relatively low productive agricultural sector to the high productive nonagricultural sector(1) contributes to the increasing of rural households' income, thus we expect it would narrow urban-rural disparity.

3. Methodology

As shown in Figure 1, total income comes from employed income, self-employed income, transfer income and property income. Since property income only accounts for less than 1% of total income, and transfer income (redistribution) is not generally affected by trade, we consider that trade influences distribution through employed and self-employed income. Of which, employed income comes from the nonagricultural sector, while self-employed income includes agricultural income and other self-employed income. At the national level, for urban households, employed income accounts for about 70% of total income, which holds consistency over time, only less than 5% of total income comes from self-employed income. On the other hand for rural households, self-employed income, chiefly agricultural income, is the most significant income source. However, unlike urban households, there is a continuous decrease in the share of total income as seen in the drop from 82.1% in 1992 to 58.8% in 2003. This is countered by the increase in employed income's share from 10.2% to 35% due to the off-farm labor migration. Since self-employed income contributes little to the total income of urban households, the effect of trade on urban-rural income disparity can roughly be treated as a combination of effects on (1) urban-rural employed income disparity, and (2) the difference between urban employed

(1) Bhattacharyya and Parker (1999) show that average labor productivity in agriculture is less than one-fifth that of industry and less than one-third that in the service sector in China.

Figure 1.　Income Composition of Urban and Rural Households



income and rural self-employed income.

Our empirical work undertakes two parallel analyses using identical sets of regressors.　The base specifications are

$$logQY_{it}^{E} = \alpha_0 + \alpha_{ITrade}\, logITrade_{it} + \alpha_{QX}\, logQX_{it} + u_{it} \qquad (1a)$$

and

$$logQY_{it} = \beta_0 + \beta_{ITrade}\, logITrade_{it} + \beta_{QX}\, logQX_{it} + e_{it} \qquad (1b)$$

where Q denotes urban/rural ratio, the subscript “i” indicates province and “t”

refers to time.

QY^E indicates urban-rural employed income disparity, defined as $QY^E = \frac{Y_u^E}{Y_r^E}$, where, Y^E is per capita annual employed income, the subscript "u" indicates urban and "r" is rural.

QY refers to urban-rural total income disparity, given by $QY = \frac{Y_u}{Y_r}$, where, Y is per capita annual total income.

ITrade stands for the measure of international trade, defined as exports plus imports relative to the gross regional product (ITrade=(IM+EX)/GRP). Since labor migration easily occurs between rural areas and nearby urban regions, we expect urban and rural households within a province to share the same economic environment, and the province-level data of trade not to create problems in our analysis.

QX is a summary of factors that indicate other urban-rural differentials, which is defined as $QX = \frac{X_u}{X_r}$. We include three variables for it: (1) urban-rural relative retail price index ($QRPI$), (2) urban/rural population ratio ($QPop$), and (3) relative share of primary sector labor in total labor force ($QL1$).

u or e summarizes the variation in inequality not captured by our empirical analysis.

For QY^E, since employed income comes from the nonagricultural sector, trade effects can be interpreted as the sum of the effect on the skilled-unskilled (accordingly urban-rural) wage gap, and the effect on urban-rural relative nonagricultural labor (excluding self-employed nonagricultural labor). Previous discussion suggests that the former tends to be positive, while the latter is ambiguous as it combines the effects on relieving unemployment and off-farm employment. For QY, the effect on total income disparity includes all the distributional effects of trade.

We investigate the two equations together. In the case of $\alpha_{ITrade} = 0$ and $\beta_{ITrade} = 0$, trade affects neither urban-rural employed income disparity nor total income disparity. In other words, there is no effect on the difference between urban employed income and rural self-employed income, just as there is no effect on the difference between urban employed income and rural employed income.

If $\alpha_{ITrade} = 0$ but $\beta_{ITrade} > 0$ (< 0), then trade does not influence employed income disparity but rather increases (decreases) total income disparity between urban

and rural households. This means that trade does not affect the difference between urban employed income and rural employed income, but rather widens (narrows) the difference between urban employed income and rural self-employed income.

If $\alpha_{ITrade} > 0 (< 0)$ but, $\beta_{ITrade} = 0$, then trade increases (reduces) employed income disparity but has no effect on total income disparity. We can conclude that the effect on employed income works against the effect on the difference between urban employed income and rural self-employed income. Moreover, the two reverse effects have identical magnitudes.

If $\alpha_{ITrade} > 0 (< 0)$ but $\beta_{ITrade} < 0$ (> 0), then we judge that the positive (negative) effect on employed income is offset by the strong negative (positive) effect on the difference between urban employed income and rural self-employed income. Thus trade reduces (increases) total income disparity.

If $\alpha_{ITrade} > 0 (< 0)$ and $\beta_{ITrade} > 0$ (< 0), then trade increases (decreases) both the employed income inequality and total income disparity. The effect on the difference between urban employed income and rural self-employed income becomes ambiguous depending on the magnitudes of α_{ITrade} and β_{ITrade}.

4. Data

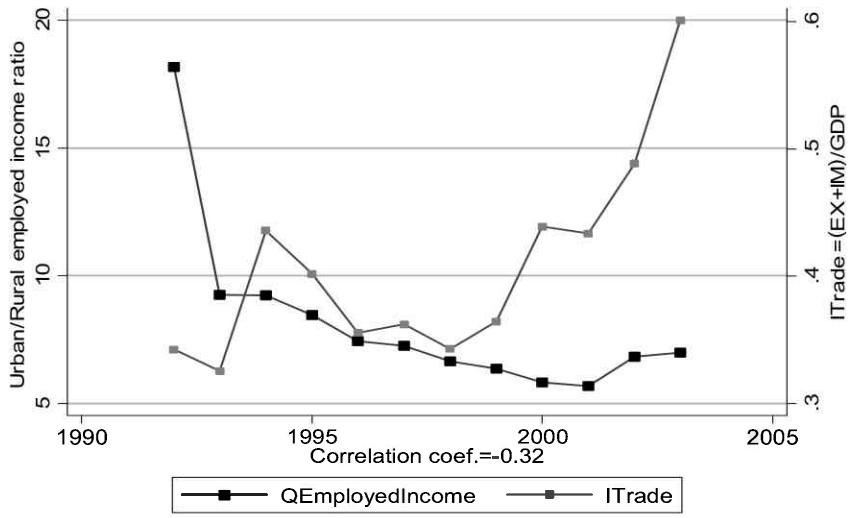
The empirical work is based on China's cross-province panel data from 1992 to 2003. Since Chongqing separated from Sichuan in 1997 to become a centrally administered municipality, we treat Sichuan (1992–1996), Sichuan (1997–2003), and Chongqing (1997–2003) as three different groups, causing the panel data set to hold 32 groups in total. The data is mainly taken from two sources: China Statistical Yearbook (CSY), and Rural Statistical Yearbook of China (RSYC), compiled by National Bureau of Statistics of China.(2)

Figure 2 graphs the evolution of income disparity and trade scale at the national level. In Figure 2-1, we find that the employed income gap roughly narrowed over time, and that the relationship between trade and employed income disparity,

(2) Most data come from CSY, except for rural population in 1992, which is missing in CSY.

especially after 1998, is unclear. Figure 2–2 shows that total income disparity reduced once after 1994 but increased again after 1997, hit a record high with urban income at 3.23 times rural income in 2003. We notice that the movements of total income disparity and trade scale match well. The correlation coefficient is 0.88, which declares a high degree of positive correlation between them.

2–1 The Movement of Urban-Rural Employed Income disparity and Trade Scale



2–2 The Movement of Urban-Rural Total Income disparity and Trade Scale

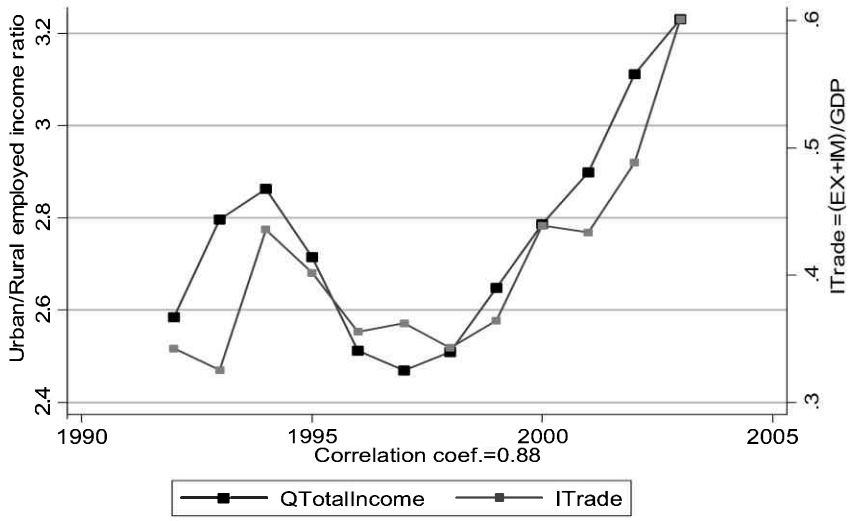


Figure 2. Urban-rural disparity and Trade Scale (National level data)

Table 1. Means (Standard Deviations) of Key Variables

	Full sample	East	Other regions
Log (urban/rural employed income ratio)	2.236 (0.935)	1.703 (0.951)	2.593 (0.735)
Log (urban/rural total income ratio)	0.979 (0.244)	0.833 (0.182)	1.077 (0.232)
Log (trade/GRP)	−1.762 (0.913)	−0.914 (0.806)	−2.331 (0.39)
Log (urban/rural RPI)	0.058 (0.055)	—	—
Log (urban/rural population ratio)	−0.903 (0.765)	—	—
Log (urban/rural labor share in 1stindustry)	−3.109 (0.805)	—	—
Number of Observations (Groups)	359 (32)	144 (12)	215 (20)

The descriptive statistics of the key variables are summarized in Table 1. Compared with total income disparity, employed income disparity holds bigger standard deviations, it seems to vary greatly across province and over time. The mean value of Log (urban/rural RPI ratio) is positive, indicating that price level in urban areas are higher than that in rural in average. The development of nonagricultural industry in rural areas fall far behind urban, with the mean value of Log (urban/rural labor share in 1st industry) is smaller than −3, that is, the ratio of labor in 1st industry/total labor in rural areas is about 30 times the ratio in urban. More notably, there are significant regional differentials. Compared with the provinces in the central and western regions, provinces belonging to the eastern coastal region(3) have a larger trade scale and a lower degree of income disparity. For this issue, we will include regional factors in our analysis in the next section.

5. Estimation and Results

We use Random-Effects (RE) models and Fixed-Effects (FE) models to control for unobservable provincial specific effects. That is, the error component model for the disturbances can be written as

(3) The eastern coastal region includes 12 provinces: Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Guangxi and Hainan. Other provinces belong to the central and western region.

$$u(e)_{it} = \mu_i + v_{it} \quad (2)$$

where μ_i denotes time-invariant province-specific effect and v_{it} denotes the remainder disturbance. If μ_i are assumed as $\mu_i \sim IID(0, \sigma_\mu^2)$, then it is a RE model. If μ_i are treated as unknown parameters to be estimated, then the model is a FE model.

We introduce year dummies to check whether there are time-specific effects. Moreover, panel data often displays a serial correlation of the disturbances over time. Since "The received empirical literature is overwhelmingly dominated by the AR(1) model, ..., The first-order autoregression has withstood the test of time and experimentation as a reasonable model for underlying processes that probably, in truth, are impenetrably complex" (Greene, 2002), we offer GLS estimator (REAR (1)) for RE model and within estimators (FEAR(1))(4) for FE model assuming the remainder disturbance term is AR(1) process. In this case,

$$v_{it} = \rho v_{i,t-1} + \varepsilon_{it} \quad (3)$$

where $|\rho| < 1$, $\varepsilon_{it} \sim IID(0, \sigma_\varepsilon^2)$ and $v_{i0} \sim (0, \frac{\sigma_\varepsilon^2}{1-\rho^2})$.(5)

5.1 The effects of trade on urban-rural income disparity

Table 2 presents the results regarding the effect of international trade on urban-rural disparity, Table 2-1 reports the results for employed income disparity, and Table 2-2 summarizes the results for total income disparity. Because the Hausman test rejects the null hypothesis that the province-specific effect is random in every specification, our discussion focuses on FE and FEAR(1) models.

Column (1) and (4) present the FE results for the base specifications. In column (1), it indicates that a 1% growth in the trade scale will lead to a 0.602% increase in employed income inequality, the elasticity of total income disparity with respect to trade is 0.124 as reported in column (4), making both the coefficients are reported

(4) In order to remove the fixed-effects, the first observation of each panel is dropped in the FEAR(1) model.

(5) The statistic of Baltagi-Wu LBI (Baltagi and Wu (1999)) tests the null hypothesis that AR coefficient (ρ) equals zero. Unfortunately, no tables are currently available for the Baltagi-Wu LBI, it is impossible to report the significant level.

Table 2. The effects of trade on urban-rural employed income disparity and total income disparity (No. of Groups=32)

	2-1 Effect on employed income disparity			2-2 Effect on total income disparity		
	(1)	(2)	(3)	(4)	(5)	(6)
	FE	FE	FEAR(1)	FE	FE	FEAR(1)
Log (Trade/GRP)	0.602***	0.298***	0.009	0.124***	0.046**	0.04*
	(0.089)	(0.077)	(0.068)	(0.021)	(0.02)	(0.021)
Log (U/R RPI)	−3.298***	−1.283*	−1.399*	−0.438*	−0.519***	−0.406*
	(0.981)	(0.727)	(0.792)	(0.235)	(0.192)	(0.241)
Log (U/R population)	−2.4***	0.409	0.227	0.309***	−0.114	−0.112
	(0.266)	(0.331)	(0.27)	(0.064)	(0.088)	(0.084)
Log (U/R labor share in 1 stindustry)	0.094	−0.417***	−0.068	0.004	−0.019	0.035
	(0.147)	(0.109)	(0.08)	(0.035)	(0.029)	(0.024)
Year dummies	NO	YES	YES	NO	YES	YES
H0: no time-specific effect	—	35.37***	28.67***	—	23.74***	29.98***
	—	(11,312)	(10,281)	—	(11,313)	(10,282)
ρ (estimated AR coefficient)	—	—	0.532	—	—	0.730
Baltagi-Wu LBI	—	—	1.987	—	—	0.932
Number of Observations	359	359	327	360	360	328
Hausman Test	227.33(4)***	194.98(15)***	741.51(14)***	402.14(14)***	70.87(15)***	230.36(14)***

Note: Standard errors in ( ), degrees of freedom in ( ). ***, ** and * indicate significant at the 1%, 5% and 10% levels, respectively. Constant term are controlled in all operations but not reported here. In all the specifications, the null hypothesis of all the province-specific effects or time-specific effects equals zero are all rejected at a high statistical significant level.

at the 1% statistical significant level. Adding year dummies in addition to the province fixed effects, column (2) and (5) show that the coefficient on trade is 0.298 for employed income disparity and 0.046 for total income disparity. The coefficients are comparatively smaller than the corresponding results reported previously, but both the estimates are still positive and statistically significant. The null hypothesis that there is no time-specific effect is strongly rejected. Assuming v_{it} follow an AR(1) process, for employed income disparity (column (3)), the coefficient on trade is reported slightly positive (0.009) and statistically insignificant. Other coefficients also differ greatly from those reported in column (2).(6) As for total income disparity, the result summarized in column (6) is similar to that in column (5). The elasticity of total income disparity with respect to trade is 0.04, remaining positive and significant at the 10% level. In summary, the provinces with an increase in trade tend to witness an increase in total income disparity, but there is no significant evidence to support that trade expansion changes employed income disparity. In addition, higher relative price seems to decrease income disparity, making the coefficients on Log urban-rural relative RPI significantly negative in both FEAR(1) regressions.

5.2 The effects of trade on urban-rural income disparity across regions

In order to examine whether the effect of international trade on inequality varies regionally, regional dummies are interacted with trade, that is

$$logQY_{it}^{E} = \alpha_0 + \alpha_{ITrade}^{East} logITrade_{it} * East + \alpha_{ITrade}^{Other} logITrade_{it} * Other + \alpha_{QX} logQX_{it} + \alpha_{East} East + u_{it} \quad (4a)$$

and

$$logQY_{it} = \beta_0 + \beta_{ITrade}^{East} logITrade_{it} * East + \beta_{ITrade}^{Other} logITrade_{it} * Other + \beta_{QX} logQX_{it} + \beta_{East} East + e_{it} \quad (4b)$$

where, East and Other are regional dummies. East=1 and Other=0 if the province

(6) Regressing the residuals from LSDV model (including year dummies and province dummies) by Equation(3), AR coefficient (ρ) is 0.294 and the null hypothesis that ρ equals zero is rejected at the 1% significant level. So the model with AR(1)error might show more appropriate results.

belongs to the eastern coastal region. East=0 and other=1 if the province belongs to the central and western regions.

The abbreviated estimation results are reported in Table 3. We include year dummies in every specification since time-specific effect is strongly supported at the 1% statistical significant level. The Hausman tests reject the RE and REAR (1) specifications, therefore, we will discuss the results of the FE and FEAR(1) models only.

Table 3-1 summarizes the effect of trade on employed income disparity. The F test supports that trade effect changes across regions. In the FE model, the elasticity of employed income disparity with respect to trade is 0.508 in eastern coastal region and significant at the 1 % level, while in other regions it is 0.153 but statistically insignificant. In the FEAR(1) model, varies regionally at the 10% statistical level, the elasticity is −0.095 in the east and 0.089 in other regions, both reported insignificant at the 10% level.(7)

In Table 3-2, we check the effect of trade on total income disparity regionally. The results of the FE model are essentially the same as we saw in the FEAR(1) estimation. The F tests report that the effect of trade varies across region, the statistic is significant at the 1% statistical level in the FE model and lower, at the 12% level in FEAR(1) model. In the eastern coastal region, the elasticity of total income disparity with respect to trade is 0.128 (significant at the 1% level) in FE model and is reported as 0.073 (significant at the 5% level) in the FEAR(1) model. No significant effect is found in the western and central regions.

Summarizing, it is desirable to include regional factors in the model. It can be seen that trade is a significant determinant of total income disparity in the eastern coastal region but has little effect in other regions. The effect of trade on employed income disparity is not significant in each region.

5.3 The effects of trade on urban-rural disparity over time

As discussed in the previous section, Figure 2 tells us that after 1998 the rela-

(7) Regressing the residuals from LSDV model by Equation(3), AR coefficient (ρ) is 0.229 and the null hypothesis that ρ equals zero is rejected at the 1% significant level. So it is possible that the FEAR(1) model shows more appropriate results.

Table 3. The effects of trade on urban-rural income disparity across regions (No. of Groups=32)

	3-1 Effect on employed income disparity		3-2 Effect on total income disparity	
	(1)	(2)	(3)	(4)
	FE	FEAR(1)	FE	FEAR(1)
Log (Trade/GRP) in the East	0.508***	−0.095	0.128***	0.073**
	(0.108)	(0.091)	(0.028)	(0.03)
Log (Trade/GRP) in other regions	0.153	0.089	−0.009	0.023
	(0.093)	(0.078)	(0.024)	(0.024)
H0: Trade effect in East=which in Other	7.60 (1,311)***	3.27 (1,280)*	16.74 (1,312)***	2.49 (1,281)
ρ (estimated AR coefficient)	—	0.519	—	0.722
Baltagi-Wu LBI	—	2.002	—	0.977
Number of Observations	359	327	360	328
Hausman Test	76.08 (16)***	705.45 (15)***	28.97 (16)**	540.64 (15)***

Note: Standard errors in ( ) , degrees of freedom in ( ) . ***, ** and * indicate significant at the 1%, 5% and 10% levels, respectively. Year dummies and constant term are controlled in all operations. In each specification, the null hypothesis of all the province-specific effects or all the time-specific effects (controlled by year dummies) equals zero is rejected at a high statistical significant level. All the other variables are not reported here, the result is available upon request.

tionship between employed income disparity and trade became more ambiguous. In addition, the movement of total income disparity changed. For these issues, we divide 1992–2003 into two periods such as 1992–1997 and 1998–2003 to check the effect of trade over time. In order to sustain sufficient observations for estimation, we do not estimate the functions (4a and 4b) respectively by period but multiply the independent variables by period dummies, that is

$$logQY_{it}^{E} = \alpha_0 + \sum_{j=1}^{2} T_j (\alpha_{ITrade_j}^{East}\, logITrade_{it} * East + \alpha_{ITrade_j}^{Other}\, logITrade_{it} * Other + \alpha_{QX,j}\, logQX_{it} + \alpha_{East,j} East) + u_{it} \quad (5a)$$

and

$$logQY_{it} = \beta_0 + \sum_{j=1}^{2} T_j (\beta_{ITrade_j}^{East}\, logITrade_{it} * East + \beta_{ITrade_j}^{Other}\, logITrade_{it} * Other + \beta_{QX,j}\, logQX_{it} + \beta_{East,j} East) + e_{it} \quad (5b)$$

where, T_j refers period dummies, j =1,2. T_1=1 and T_2=0 if 1992≦ year ≦1997, while T_1=0 and T_2=1 if 1998≦year≦2003.

The results are contained in Table 4. The null hypothesis that effects of trade change over time is not strongly supported. For employed income disparity, the FEAR(1) model seems desirable,(8) and there is still no strong evidence to prove trade has any effect on employed income disparity. As for total income disparity, in table 4–2–(3), the Hausman test does not reject the RE specification. Moreover, the results of the RE model differ little from that estimated by the FE and FEAR (1) model. Similar to the results reported prior, the expansion of trade leads to an increase in total income disparity in the eastern region, but seldom works on other regions.

Summarizing the results, we find that:

(1) Trade expansion has little effect on urban-rural employed income disparity

(8) Regressing the LSDV residuals by Equation(3), AR coefficient (ρ) is 0.207 and the null hypothesis that ρ equals zero is rejected at the 1% significant level.

Table 4. The effects of trade on urban-rural income disparity over time (No. of Groups=32)

	4-1 Effect on employed income disparity				4-2 Effect on total income disparity			
	(1)		(2)		(3)		(4)	
	RE	FE	REAR(1)	FEAR(1)	RE	FE	REAR(1)	FEAR(1)
Log (Trade/GRP) in the East (1992-1997) (E1)	0.428***	0.479***	0.248**	0.002	0.09***	0.104***	0.09***	0.085***
	(0.105)	(0.115)	(0.124)	(0.09)	(0.026)	(0.029)	(0.029)	(0.032)
Log (Trade/GRP) in other regions (1992-1997) (O1)	0.159	0.197*	0.106	0.101	0.002	0.003	0.001	−0.002
	(0.115)	(0.109)	(0.139)	(0.086)	(0.028)	(0.028)	(0.028)	(0.029)
Log (Trade/GRP) in the East (1998-2003) (E2)	0.275**	0.44***	0.089	−0.1	0.074***	0.092***	0.083***	0.067**
	(0.113)	(0.122)	(0.128)	(0.094)	(0.028)	(0.031)	(0.029)	(0.032)
Log (Trade/GRP) in other regions (1998-2003) (O2)	0.07	0.016	0.192	0.086	−0.035	−0.03	0.034	0.04
	(0.111)	(0.105)	(0.13)	(0.085)	(0.027)	(0.027)	(0.026)	(0.028)
H0: Effect in E1=Effect in O1	3.38(1)*	3.54 (1,305)*	0.66(1)	0.77 (1,274)	5.87(1)**	6.92 (1,306)***	5.63(1)**	5.04 (1,275)**
H0: Effect in E2=Effect in O2	1.97(1)	7.97 (1,305)***	0.39(1)	2.85 (1,274)*	9.03(1)***	10.18 (1,306)***	2.01(1)	0.60 (1,275)
H0: Effect in E1=Effect in E2	4.41(1)**	0.30 (1,305)	2.63(1)	3.15 (1,274)*	0.72(1)	0.40 (1,306)	0.13(1)	0.78 (1,275)
H0: Effect in O1=Effect in O2	0.53(1)	2.45 (1,305)	0.32(1)	0.03 (1,274)	1.48(1)	1.25 (1,306)	1.14(1)	1.91 (1,275)
ρ (estimated AR coefficient)	—	—	0.542	0.435	—	—	0.75	0.699
Baltagi-Wu LBI	—	—	1.609	2.042	—	—	0.946	0.810
Number of Observations	359	359	359	327	360	360	360	328
Hausman test	21.56 (22)		414.05 (21)***		23.10 (22)		149.19 (21) ***	

Note: Standard errors in ( ), degrees of freedom in ( ). ***, ** and * indicate significant at the 1%, 5% and 10% levels, respectively. Year dummies and constant term are controlled in all operations. In each specification, the null hypothesis of all the province-specific effects or all the time-specific effects (controlled by year dummies) equals zero is rejected at a high statistical significant level. All the other variables are not reported here, the result is available upon request.

but increases urban-rural total income disparity in the eastern coastal region.

(2) International trade does not work on urban-rural income disparity in the central and western regions.

(3) These results remain unchanged even after time differences are controlled.

6. Further Discussion

6.1 Why does trade expansion increase total income disparity but have no effect on employed income disparity in the eastern coastal region?

As noted in section 3, in the case that trade has no significant effect on employed income disparity but increases total income disparity, the difference between urban employed income and rural self-employed income widens.

Turning back to Figure 1, we find that the self-employed income in rural households mostly comes from the agricultural sector. For simplicity, we regard self-employed income as agricultural income. In doing so, it shows that trade has no effect on urban-rural nonagricultural income disparity, but does positively effect the differential between urban nonagricultural income and rural agricultural income.

In section 2, we summarized the wage effects and the employment effects of trade on income distribution. For urban-rural nonagricultural income disparity (employed income disparity), trade tends to increase the disparity of skilled-unskilled wages. Judging from the estimation result, employment effects should favor rural households more and offset wage effects. In which, we consider that the effect on off-farm employment may play an important role. Evidence of this can be seen in the rapid development of rural township and village enterprises and the increase of rural migration. As the remaining effect of trade on total income disparity, the effect on the differential between urban nonagricultural income and rural agricultural income is unambiguously positive, trade is likely to widen the nonagricultural-agricultural wage gap, and the effect on off-farm employment reduces agricultural labor. As a consequence, total income disparity increases with trade expansion.

6.2 Why does trade work on the income disparity in the eastern region but seldom have influence in the central and western regions?

In section 4, we mentioned that there is a great differential in trade between regions in China. Since labor migration from an inland area to a coastal region is restrained due to the hukou system of permanent registration and other factors, it is difficult for inland residents to share the benefits of trade that occur in coastal regions. The effect on income distribution may vary region to region corresponding to the difference in trade.

We plot the movement of international trade by regions in Figure 3. Two points can be considered as possible reasons: First, compared with the trade scale in the eastern region, the weight of trade in central and western region is too small to affect income distribution. The ratio of trade/GRP is less than 20%, around 1/3 times of that found in the eastern region. It is possible that the effect of trade on local economics is somewhat limited. Second, trade scales greatly vary over time in the east, while in the central and western regions, except for the point in 1994, the trace of trade movement almost parallels the X-axis. There are too few changes for our regression estimations to receive statistically significant results.

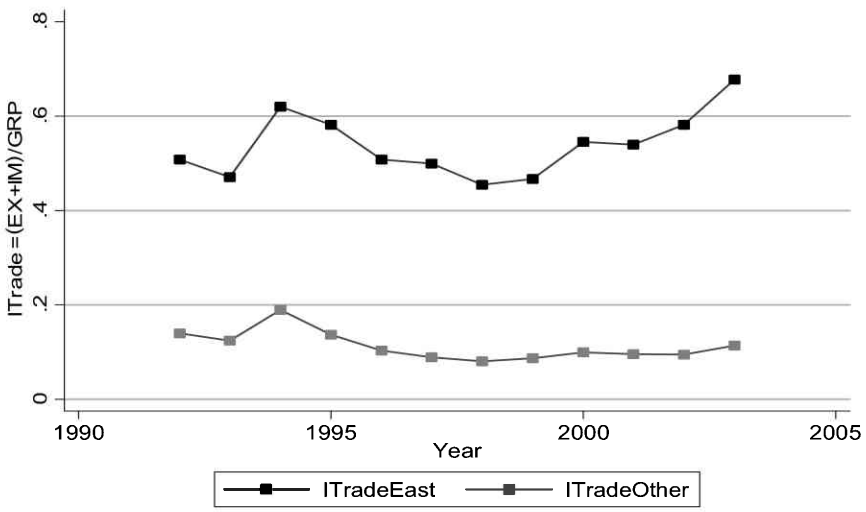


Figure 3. The Change of the Trade Scale in East and Other Regions

7. Conclusion

This paper provides a study about the impact of international trade on urban-rural income disparity in China. We expect trade to influence income distribution through affecting employment and wage rate. Due to data limitation, we cannot investigate the wage effects and employment effects directly. Using cross-province panel data of China (1992–2003), we examine the effects of trade on urban-rural employed income disparity and total income disparity, and check whether the effects change regionally or over time. The results indicate that in the eastern coastal region trade expansion has little effect on urban-rural employed income disparity but significantly increases total income disparity. On the other hand in the central and western regions, trade seldom affects urban-rural income disparity, it may due to the unchanged frequency as well as the low percentage of trade. We also find that the results are unchanged even after time differences are controlled.

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