

Unconditional Quantile Regressions, Earnings Disparity and Gender Discrimination in Post-Transformation of Urban China

Abstract

Market-oriented economic reform has gone through several key stages to bring substantial changes to current Chinese economy. It has accelerated after 1992, and meets the pattern transformation of economic development in 2002. During this dramatic and complicated economic transitional process, some issues caused people's attention included the questions as: how does the earnings distribution change between genders from early market economy to post market economy; how do education, work experience, marriage and other factors affect gender earnings and what is the difference in internal group of women. In this paper, it will be used the data of the Chinese household income projects in 2002 and 2007 to analyse earnings disparity between genders and inner woman group. The unconditional quantile regression finds that comparing with past, the negative effect on earnings of marriage and taking care of child has much decreased, especially to women. However, high return rate to education of female workers is not as significant as before, the rate of work experience even fall faster. Along with the gender earnings gap increasing, the unexplained gap (discrimination gap) also increased over time, and is particularly pronounced for the lower and higher earnings group of women.

Keywords: Unconditional quantile regression; RIF functions; Earnings inequality

1. INTRODUCTION

Earnings distribution and changes in earnings inequality kept attracting attention from researchers all over the world (Blau and Kahn 2000; Oaxaca 1973; Zhang et al. 2008). Some researchers in China focused on how the market force has affected gender earnings inequality over time (Berik, Rodgers and Zveglic 2004; Gustafsson and Li 2000; Maurer-Fazio and Hughes 2002). Several other studies examine gender earnings gap in different areas comparing the eastern seaboard provinces with western interior ones (Liu, Meng and Zhang 2000; Ng 2007) or in different types of firms contrasting state-owned enterprises with collective, private or joint venture enterprises (Deng and Li 2009; Zhang and Dong 2008).

There is also surging interest in examining gender earnings gaps across an earnings distribution not just simple mean comparison (Albrecht, Björklund and Vroman 2003; Barsky et al. 2002; Chi and Li 2008; Chi, Li and Yu 2011; Firpo, Fortin and Lemieux 2007; Ge, Li and Zhang 2011; LI and DONG 2011; Zhang, Hannum and Wang 2008). These kind of analysis can provide more information which may be hidden in the mean-level analysis and can help to test the real situation of earnings gaps in different position of earnings distribution (Ge, Li and Zhang 2011; Sakellariou 2012). For example, there is an extremely large gap between men and women in Sweden at the top of the earnings, but when using the mean-level analysis, the average gender gap in Sweden is quite small by international standards (Albrecht, Björklund and Vroman 2003). Similar, finds in China demonstrates gender discrimination has increased from 1988 to 1995, but to higher income group of workers, it is actually decreased (Bishop, Luo and Wang 2005; Gustafsson and Li 2000; LI and DONG 2011). Therefore extending the mean-level analysis to distributional level analysis is necessary if one want to compare different part of the earnings distribution.

So in this paper, it will implements recent advances in methodology, a two-stage procedure proposed by Firpo, Fortin and Lemieux (2007, 2009) to analysis the current situation of female workers in labour market in urban China. The unconditional regression finds outcomes that comparing with past, the negative effect on earnings of marriage and taking care of child has much decreased, especially to women. However, high return rate to education of female workers is not as significant as before, the rate of work experience even fall faster. Along with the gender earnings gap increasing, the unexplained gap (discrimination gap) also increased over time, and is particularly pronounced for the lower and higher earnings group of women.

The rest of this paper is organized as follows: section 2 describes the data used in this paper and presents some basic stylized facts on gender difference in labour force, section 3 provides an introduction on the methodology of unconditional quantile regression and model specification, section 4 presents the major empirical result and graphs giving more clearly explanation, section 5 sums up the whole paper and offers conclusions.

2. DATA AND OVERVIEW

The data used in this paper was obtained from the Chinese household income projects in 2002 and 2007. These surveys, supported by Chinese Academy of Sciences (CAS), Asian

Development Bank (ADB) and Ford Foundation, are designed to estimate the distribution of income in China. The data contained both surveys of urban and rural population, but here it is strict to the urban population, meanwhile satisfying the condition that not retired and have income in respective year. The earnings are defined as the sum of regular wages, floating wages, all kinds of bonuses, subsidies, cash income and allowances. There are 10,288 observations for year 2002 and 6,899 observations for year 2007.

The main variables by gender are demonstrated in table 1 and table 1 (cont.) from which it can be easily found out that male-female ratio of earnings has increased from 1.18 to 1.31 although the earnings of both men and women have more than doubled over years. The education gap between genders has kept decreasing until almost the same in 2007, but the other aspect of human capital-work experience, its gap has increased slightly from 2.9 years in 2002 to 3.8 years in 2007. As to the marital status, married couples decreased for both male and female workers.

TABLE 1. Descriptive Statistics of Main Variables by Gender from 2002 to 2007

Variable	Male/2002	Female/2002	M/F Ratio
Demography	5699	4589	
Work experience	24.34	21.50	1.13
Year of schooling	11.47	11.34	1.01
Married (%)	49.23	38.72	1.27
Occupation			
Owner (manager) of private firm	0.57	0.29	1.97
Self-employed	4.33	4.2	1.03
Professional	20.15	22.54	0.89
Director of government, institution and enterprise	3.78	1.02	3.71
Department director of gov., institution and ent.	11.26	3.81	2.96
Clerical/office staff	17.75	23.52	0.75
Skilled worker	23.99	12.23	1.96
Unskilled worker	8.62	11.15	0.77
Salesclerk or service worker	7.54	18.52	0.41
Farmer	0.00	0.02	0
Other	2.02	2.70	0.75
Earnings			
Total earnings per hour (2002)	6.13	5.18	1.18

(continued)

TABLE 1.(Cont.) Descriptive Statistics of Main Variables by Gender from 2002 to 2007

Variable	Male/2007	Female/2007	M/F Ratio
Demography	3964	2935	
Work experience	23.15	19.20	1.21
Year of schooling	12.19	12.19	1.00
Married (%)	48.89	35.64	1.37
Occupation			
Boss of private enterprises	9.21	4.43	2.08
Technical personnel in various industry	24.54	21.39	1.15
Administrative staff and manager	21.85	26.60	0.82
Businessman/commercial staff	17.46	28.71	0.61
Service personnel	0.85	0.46	1.85
Manufacture and transportation worker	18.77	10.70	1.75
Self-employed individuals	0.59	0.25	2.36
Labourer	5.95	6.37	0.93
Other	0.78	1.09	0.72
Earnings			
Total earnings per hour (2007)	16.33	12.41	1.32

Source: Chinese Household Income Project, 2002 and 2007.

The changes of occupation proportion have been witnessed over time. In 2002, the highest occupation proportion for man and woman are skilled workers and clerical staff respectively. Male workers were more likely to work as director or department director of government, institution and enterprise, while women were usually employed as salesclerk, service or unskilled workers. In 2007, the percentage of female technical personnel and administrative staff has largely increased that making the gender difference in occupation distribution even more uneven. In the area of administrative staff and commercial staff, there have been accumulated 55 percent female workers and the absolute quantity are much more than male. But in other certain occupations, male workers can be twice more. For example, the notable male-female ratios are 2.36 and 2.07 in occupation ‘manager or boss of private firm’ and ‘self-employed’ as the result of distinct increase in both sector over time.

3. METHODOLOGY

3.1 The unconditional quantile regression model

The method used in this paper based on the recentered influence function (RIF) developed by Firpo, Fortin and Lemieux in 2009 when they studying diffident effect of unionization at the lower and higher portion of wage distribution in the US (Firpo, Fortin and Lemieux 2009). This method provides a computationally regression model to evaluate the impact of changes in the distribution of explanatory variables (such as education, union status) on quantiles of the unconditional (marginal) distribution of dependent variable (such as earnings). The advantage of RIF method is that it can generate Oaxaca-Blinder decompositions for quantiles instead of the mean. Here it will decompose the earnings variable at different quantiles into the ‘composition effect’-component attributable to the gender difference in productivity characterises and the ‘structure effect’-the unexplained component due to differences in the return to workers’ characters (Chi and Li 2008).

The decomposition procedure consists of two steps: the first step resembles DiNardo et al. (1996) that decompose the overall changes in the earnings distribution to change of differences in characteristics and the changes of returns to these characteristic. A counterfactual earnings distribution is constructed showing what earnings women would get if they received the same returns to their work characteristics as men. If the $v(Y)$ represents a quantile of the earnings distribution of Y . The overall differences can be decomposed into:

$$v(Y_m) - v(Y_f) = [v(Y_m) - v(Y_c)] + [v(Y_c) - v(Y_f)] \quad (1)$$

In this equations, Y_m and Y_f represent earnings of male workers and female workers respectively, Y_c is a counterfactual earnings expression. $v(Y_m) - v(Y_c)$ represents the ‘composition effect’ and $v(Y_c) - v(Y_f)$ represents the ‘structure effect’. The counterfactual earnings Y_c can be obtained by reweighting observations (DiNardo, Fortin and Lemieux 1996; Firpo, Fortin and Lemieux 2007). The reweighting factor is defined as:

$$\psi_i = [1 - p(X_i)]p/p(X_i)(1 - p) \quad (2)$$

Here $p(X)$ is ‘the probability of a worker being a male given individual attributes X ’ and p denotes the proportion of males in the population. It can be estimated by logit/probit model. Therefore the reweighted data ψY_m can be thought as realization from the counterfactual log-earnings distribution Y_c .

The second step is to further decompose the ‘composition effect’ and ‘structure effect’ into the contribution of each individual covariate. As the well-known regression models establishing relationships between a response variable Y and a set of explanatory variables X cannot answer questions about the unconditional statistical properties of the response variable Y , the RIF method make use of unconditional quantile regression to make up the defects (Firpo, Fortin and Lemieux 2007). Central concept to the RIF unconditional method is the influence function and assumes a linear regression, see the following form:

$$E [RIF (Y; q_\tau) | X] = X \beta_\tau \quad (3)$$

Here the coefficient β_τ represents the marginal effects of the explanatory variables X at the earnings quantile q_τ . For each year, the RIF unconditional quantile regression is estimated for male, female and counterfactual earnings distribution:

$$\widehat{RIF} (Y_k; \hat{q}_\tau) = X_k \hat{\beta}_k, \quad k = m, f, c \quad (4)$$

here the subscripts m, f, c represent male, female, and counterfactual respectively, $\widehat{RIF}(Y_k; \hat{q}_\tau)$ denotes the RIF estimate for the τ th quantile, the $\hat{\beta}$ represents the estimate of the unconditional quantile partial effect. Using the unconditional quantile regression from Eq. (4), the deposition can be given as follows:

$$\hat{q}_\tau(Y_m) - \hat{q}_\tau(Y_f) = [\bar{X}_f(\hat{\beta}_c - \hat{\beta}_f) + \hat{R}_\tau^S] + [(\bar{X}_m \hat{\beta}_m - \bar{X}_f \hat{\beta}_c) + \hat{R}_\tau^C] \quad (5)$$

$\hat{q}_\tau(Y_m) - \hat{q}_\tau(Y_f)$ represents the gender earnings difference at the τ th quantile. \bar{X} represents the vector of covariate averages. $\hat{\beta}_c$ is the counterfactual variable which assumes the male returns to labour force characteristics for female. Thus $\bar{X}_f(\hat{\beta}_c - \hat{\beta}_f)$ represents the ‘structure effect’ and $\bar{X}_m \hat{\beta}_m - \bar{X}_f \hat{\beta}_c$ represents the ‘composition effect’. \hat{R}_τ^S and \hat{R}_τ^C are the errors to these effects.

3.2 Model specification

It will be used log earnings per hour for males and females respectively as a function of the following variables:

- i) Years of schooling;
- ii) Work experience which is $(\text{age} - \text{year of schooling} - 6)^2$;
- iii) Marriage, 1 for married, 0 for other else;
- iv) Whether have young child, 1 for have child under 6 years old, 0 for not;
- v) Indicator variable for occupation (white collar for default variable);
- vi) Ownership (S.O.E for default variable)
- vii) Industry (Manufacture for default variable)

Variables from i) to iv) are most focused onto in this paper. The education level and work experience are commonly thought positively related to workers' earnings. Getting married is typically assumed to increase male earnings, as married men are generally less satisfied with their income and would put more effort into their work leading to higher incomes because of labour division within the household (Pollmann-Schult 2011). In contrast, it has negative effect on women's earnings for the same reason-majority of female workers were regarded spending more time and energy on family life, especially after the couple have a child (Lundberg and Rose 2000; Schneider 2011; Waldfogel 1998). Therefore child, especially young child, is thought to have downside effect to women's earnings, whereas to men, it seems have little effect (Waldfogel 1998). Some scholars hold the opinion that as the work experience accumulated differently, men may win the advantage to get promotion and gain salary raising when compete with women who have children (Clark and Corcoran 1986).

Different type of occupation not only means different kinds of human capital which in some extent determined the income level, but also implies occupational barrier among various types of jobs. Here, the types of occupation, ownership and industry are control variables. The types of occupation are summarized as private enterprise owner, white collar, blue collar and other occupations. For ownership of corporation, there are five forms classified: state owned enterprise (S.O.E), urban collective, private enterprises, foreign-owned or joint venture and others. As to types of industry, the manufacture is default variable, the others are construction, transportation, commerce, real estate, education, sciences and research, government, social welfare, financial sectors and other industries.

4. EMPIRICAL RESULTS

4.1 Preliminary description of gender earning distribution

The results from kernel density estimation demonstrate log hour earnings distribution for urban male and female workers in 2002 and 2007 as shown in figure 1a and figure 1b. The long lower tail appears in 2002 suggesting the existence of low-earnings workers, especially for women. The unsymmetrical shape also suggests the lower half of the earning distribution is more dispersed than the upper half earnings of male and female in 2002. The conclusion is just opposite for female workers in 2007 where higher earnings distribution is more dispersive. And to male workers, it becomes more uniform distribution comparing with the pointed shape in 2002.

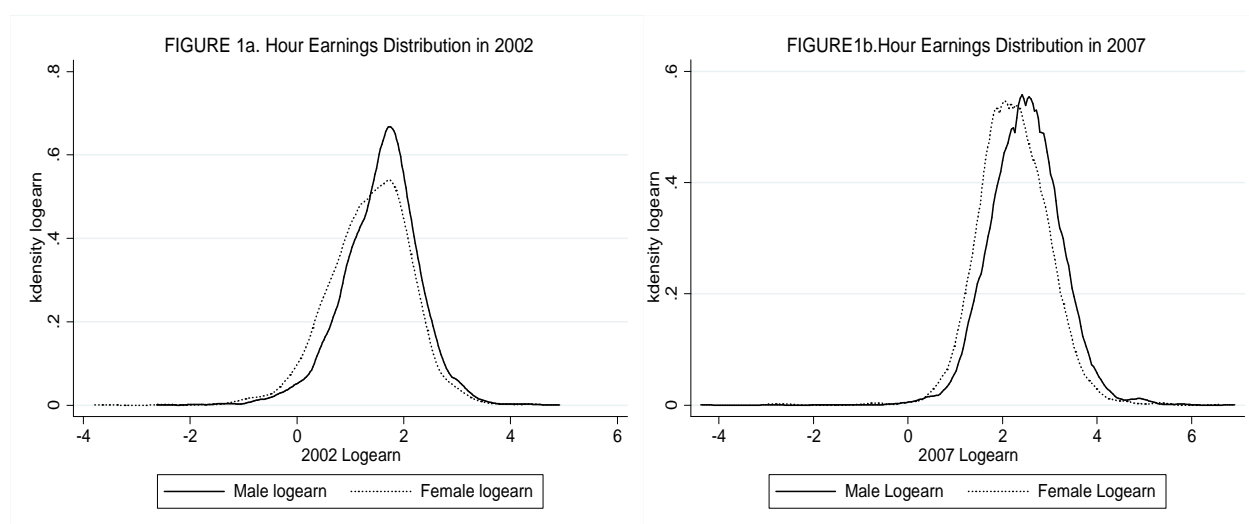


TABLE 2. Quantile Earnings Distribution Comparison 2002 and 2007

	2002			2007		
	Male	Female	M/F Ratio	Male	Female	M/F Ratio
Mean	6.13	5.18	1.18	16.37	12.54	1.31
P10	1.94	1.46	1.32	4.69	3.75	1.25
P50	5.09	4.09	1.24	12.5	9.38	1.33
P90	10.92	9.47	1.15	31.25	23.13	1.35
P90:P10 Ratio	5.63	6.49	/	6.66	6.17	/
P50:P10 Ratio	2.62	2.80	/	2.67	2.5	/
P90:P50 Ratio	2.15	2.32	/	2.5	2.47	/

Source: Chinese Household Income Project, 2002 and 2007

Notes: Earnings are at 2002 and 2007 price.

Table 2 estimates the earnings distribution for male and female at different quantiles. The mean gender earnings gap increases from 1.18 (2002) to 1.31 (2007), and changes a lot at various quantiles. In 2002, the male-female ratio of earnings is larger in lower paid groups-the ratio at the first decile is 1.32, while it is 1.15 at the last decile. However situation reversed in 2007 that prominent earnings gap fell over at last decile which the ratio is 1.35, and the smallest one emerged at first decile being 1.25. The ratios of different quantile internal male and female provide information that not all earnings levels benefit equally from the earnings increase by China's economic development. For male, the higher earning level gains much more, whereas the lower earning of female gets more.

4.2 RIF unconditional quantile regression result

4.2.1 Earnings gap decompositions

In this section, the decompositions of male-female earnings gap are performed by FIR unconditional regression, and outcomes are shown in table 3. It gives 'earning gap', 'unexplained gap' and 'unexplained ratio' at different quantiles (P5, P10, P25, P50, P75, P90 and P95) in 2002 and 2007. The 'unexplained ratio' represents the ratio value of unexplained part of earnings differential to the total earnings gap. At the same time, the results from traditional OLS regression are also calculated to make a methodological result contrast.

TABLE 3. RIF Earning Gaps and Decomposition in 2002 and 2007

	P5	P10	P25	P50	P75	P90	P95	OLS
2002 Earning Gap	.2634	.3041	.2899	.2391	.1499	.1802	.2166	.2458
2002 Unexplained Gap	.1582	.2132	.1975	.1605	.0875	.1273	.1687	.1683
2002 Unexplained Ratio	.6006	.7011	.6813	.6713	.5837	.7064	.7789	.6851
2007 Earning Gap	.1696	.2531	.3087	.3231	.2562	.3377	.2560	.3056
2007 Unexplained Gap	.1504	.2181	.2757	.2900	.2158	.3033	.2459	.2732
2007 Unexplained Ratio	.8868	.8617	.8931	.8976	.8423	.8981	.9605	.8941

The findings from OLS suggests the mean earnings gap increases from 0.2458 log points in 2002 to 0.3056 log points in 2007. And the unexplained earnings gap has the same rising tendency from 0.1683 to 0.2732 which seems to show the fact that the whole situation of earning environment has deteriorated for female workers. After going on to the various quantiles of earnings, much more detail conclusion about each group can be drawn.

In 2002, the biggest gender earning gap emerges at P10 (0.3041) and the smallest is at P75 (0.1499). The unexplained gender earnings gap is highest at P95 (0.7789) and lowest at P5 (0.1582). It can be explained as that the lower earnings group of female workers bear larger earnings gap but they enduring less gender earnings discrimination from labour market. In 2007, the largest earnings gap reaches its peak at P90 (0.3377) and touches its bottom at P5 (0.1696). The differential of unexplained gap at various quantile is not very significant that the largest one is 0.9605 at P95 and the smallest is 0.8617 at P10. The outcomes suggest that with the earnings of lower female group increasing, the paid environment for female is worsened wholly than 2002 as the ratio of gender discrimination enlarges at every quantile comparison given.

4.22 Earnings return to personal characteristics

In this section, it estimate the effect of personal characteristics to earning equation at different quantile using RIF unconditional regression for male and female in 2002 and 2007 which is shown in table 3. In order to make it more clearly and more easily understood, figures 2-5 were drawn to show the comparison of returns to these personal characterises (year of schooling, work experience, marriage status and young child in family) between two genders.

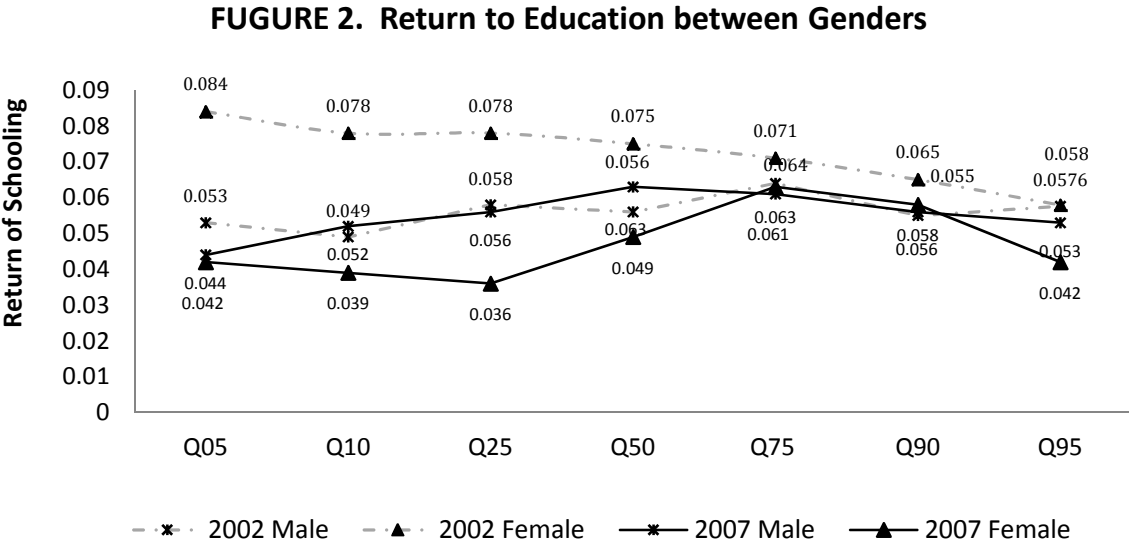


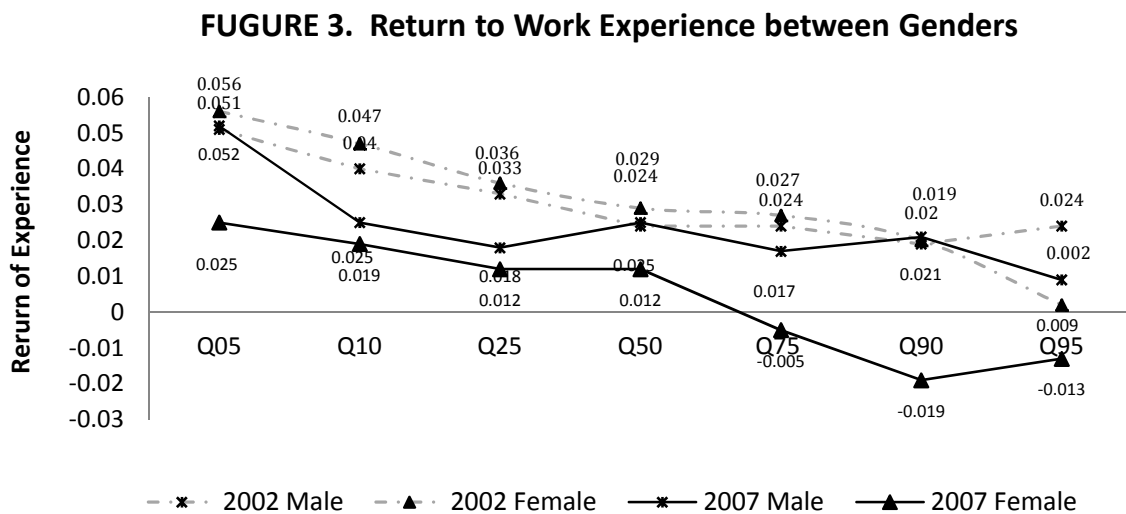
TABLE 3. Quantile Regression Estimates

2002	OLS															
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Education	.0533*** (.0111)	.0844*** (.0131)	.0487*** (.0082)	.0779*** (.0094)	.0583*** (.0055)	.0776*** (.0071)	.0560*** (.0040)	.0749*** (.0057)	.0639*** (.0044)	.0704*** (.0052)	.0552*** (.0065)	.0654*** (.0064)	.0576*** (.0091)	.0579*** (.0084)	.0576*** (.0273)	.0738*** (.0236)
Experience	.0514*** (.0158)	.0563*** (.0167)	.0400*** (.0105)	.0468*** (.0097)	.0330*** (.0062)	.0358*** (.0066)	.0239** (.0042)	.0291*** (.0056)	.0244* (.0043)	.0274*** (.0051)	.0194 (.0063)	.0195 (.0070)	.0236 (.0082)	.0017 (.0107)	.0287 (.0252)	.0293*** (.0171)
Exp2	- .0008*** (.0003)	- .0009*** (.0004)	-.0005*** (.0002)	- .0008*** (.0002)	- .0004*** (.0001)	- .0005*** (.0001)	- .0002*** (.0001)	- .0000 (.0000)	- .0002*** (.0001)	- .0003* (.0001)	- .0002* (.0001)	- .0001 (.0001)	- .0002 (.0002)	- .0002 (.0002)	- .0003*** (.0007)	- .0003*** (.0005)
Marriage	.3722*** (.1439)	.1403 (.1165)	.2636*** (.0993)	.0751 (.0803)	.1318*** (.0612)	.0327 (.0607)	.0753* (.0412)	-.0235 (.0501)	.0238 (.0395)	-.0546 (.0440)	.0162 (.0567)	-.0300 (.0565)	.2662 (.0689)	-.0004 (.0809)	.1068** (.1664)	.0130 (.1401)
Child	2.1633* (.4576)	2.5789 (.4591)	1.6467* (.3091)	1.9931* (.3661)	1.1296 (.1824)	1.2908* (.1952)	.5229 (.1231)	.7482* (.1325)	.9852* (.1271)	-.3006 (.0721)	.3212 (.0584)	-.3070 (.0633)	.0939 (.1706)	-1.132 (.1851)	1.0429* (.1013)	0.7431 (.2271)
Constant	0.2395	0.2257	0.2339	0.2304	0.2336	0.2526	0.2113	0.2523	0.2615	0.2115	0.1763	0.1758	0.1712	0.1707	0.1839	0.2173

2007	OLS															
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Education	.0443*** (.0103)	.0415*** (.0094)	.05151*** (.0091)	.0386*** (.0084)	.0556*** (.0068)	.0364*** (.0067)	.0631*** (.0065)	.0492*** (.0071)	.0610*** (.0064)	.0625*** (.0087)	.0557*** (.0087)	.0578*** (.0097)	.0533*** (.0097)	.0422*** (.0114)	.0544*** (.0044)	.0434*** (.0051)
Experience	.0515*** (.0130)	.0249*** (.0117)	.0250*** (.0101)	.0192*** (.0092)	.0176*** (.0071)	.0139*** (.0072)	.0251** (.0068)	.0121*** (.0077)	.0173* (.0071)	- (.0099)	.0205*** (.0099)	-.0188 (.0098)	.0088 (.0119)	-.0132 (.0121)	.0182** (.0052)	.0032*** (.0052)
Exp2	- .0005*** (.0003)	-.0007** (.0003)	-.0005** (.0002)	-.0006* (.0002)	-.0003* (.0001)	- .0005*** (.0001)	- .0005*** (.0001)	- .0003* (.0002)	-.0003* (.0001)	-.0003* (.0002)	.0001 (.0002)	-.0003 (.0002)	-.0004 (.0002)	-.0002 (.0002)	-.0003 (.0002)	-.0003 (.0001)
Marriage	.0560*** (.0948)	.3380** (.1203)	.0940*** (.0852)	.2364*** (.1046)	.1261* (.0641)	.1249* (.0871)	.1261 (.0559)	.1269 (.0738)	.1254* (.0541)	.1349 (.0760)	.0081* (.0814)	.0628 (.0665)	-.0632 (.0786)	.1544 (.0997)	.0936* (.0407)	.0130* (.0513)
Child	-.0401* (.0578)	-.1673* (.0603)	-.0406* (.0460)	-.1981** (.0697)	.0396 (.0865)	-.1028 (.0597)	-.0130 (.0728)	-.0453* (.0335)	-.0411* (.0421)	-.0362 (.0717)	.0001 (.0828)	.0736 (.0733)	-.0736 (.0766)	.1093 (.0811)	-.0284 (.0513)	-0.6444 (.0515)
Constant	0.1931	0.2012	0.1954	0.2076	0.1912	0.2082	0.1866	0.2119	0.1814	0.2031	0.1963	0.2655	0.1712	0.2402	0.1976	0.2598

1. Child means the effect of having a little child in family; M for male and F for female;
2. * p<0.05; ** p<0.01; *** p<0.001
3. Parenthesis is for the standard error.

By the results from OLS (shown in table 3) which report the education coefficient are 0.0576 and 0.0738 for men and women in 2002, 0.5439 and 0.4434 in 2007, it is easy to come to an impression that the education effect to man earnings keeps the same, while its raising effect for female drops a lot. The advantage of method RIF is obvious that it offers more information and takes consideration of the distribution. Figure 2 shows the outcomes provided by RIF to compare gender returns to ‘years of schooling’. The more smoothed downward dotted line indicates the return to education of female worker decreases with the earnings going up in 2002. To man, it is a fluctuated curve which highest return rate occurs at the third quartile (0.064). It should be noticed that female return rate to education is higher than that of male as a whole. However it is not the case for 2007, male workers may get more earnings than female from additional education below P75 and it appears an increasing tendency of return rate to schooling in lower half earnings. To the higher earnings group (quantile 75 to 95) of both sexes, the effect of education declines and the drop is more significant for women.



The return to work experience declines for both male and female with the earnings increasing in 2002 as figure 3 demonstrated. Same with education, it could tell that woman’s experience is more rewarding than men in 2002. These findings are broadly consistent with the findings of others who have looked at inequality earnings (Appleton et al. 2005; Meng and Miller 1995; Zhang, Hannum and Wang 2008). The female experience return curve is consistently above that of men until they intersect at the ninth decile and drops sharply in highest earnings group of women at quantile 95 which can be explained that to highest earnings women (above P90), the return of work experience is less notable than that to men. It is a little

complicated in 2007 that the overall return to work experience declines and especially for female. The drop of woman workers is so significant it reverse the fact in 2002 that male work experience is less rewarding. The line of male return to experience is a fluctuated curve, although has downward tendency in the whole, still positive. Whereas the return rates are even minus for upper half earnings group of women which can be concluded that experience not only far from help female to gain more earnings but have a negative effect.

FIGURE 4. Return to Marriage between Genders

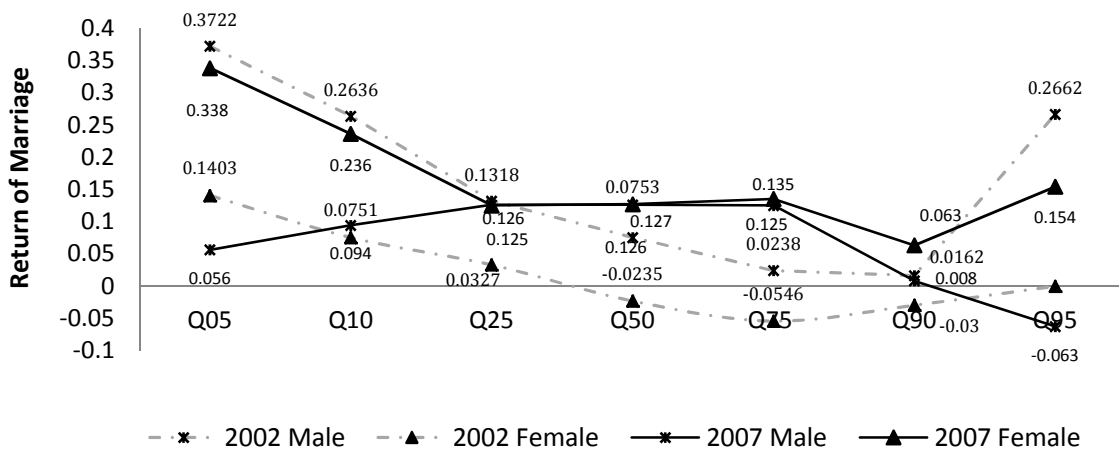
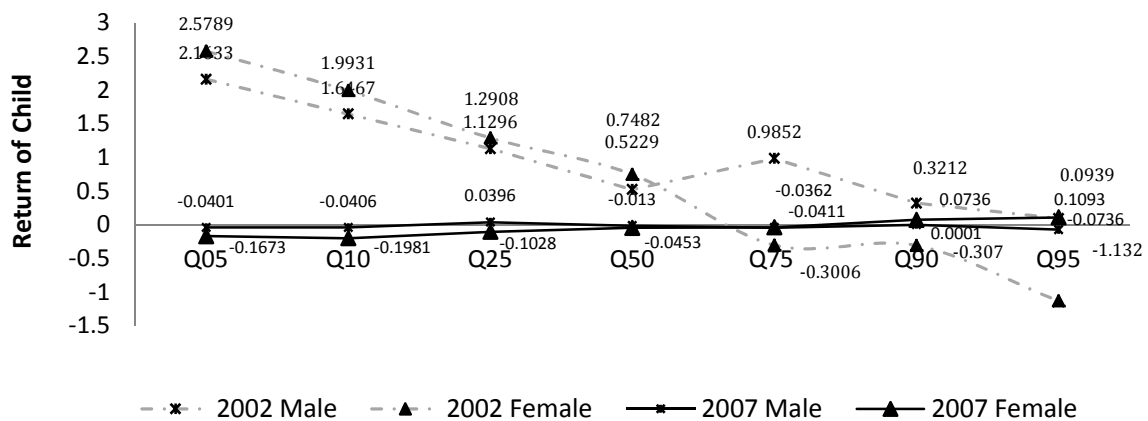


Figure 4 plots the impact of marriage on the earnings distribution for male and female. In 2002, the return curves for both men and women have an approximately similar shape showing declining trend as earnings improved below the third quartile, then going up first slowly to the ninth decile and more rapidly to quantile 95. It is worth mentioning that for men, although the return is declining, marriage still has a positive effect in 2002, but for women, getting married may reduce their earnings because the return rate in upper half is less than zero. Situation has changed a lot when the time is right for 2007. Female gains more than male from the marriage especially in higher (Q75) or lower (Q25) earnings groups and at least obtains almost the same rate with male in middle-earnings group. The minus of marriage coefficient (-0.063) of highest earning men (Q95) is great contrasts to that in 2002 which means marriage damage their opportunities to gain more earnings.

It is estimated the impact of having a little child (younger than 6 years old) in household using RIF as shown in figure 5. The roughly outcomes can be concluded by OLS that there are positive coefficients (1.0429 and 0.7431) in 2002, but negative ones (-0.0284 and -0.6444) in 2007. More detail suggestions can be drawn from unconditional quantile research. In 2002,

shapes of curves for male and female are much the same and both have downward direction in lower half earnings group. After that, the line for female meets the junction with male and keeps going down till less than zero and reach its nadir at Q95 (-1.132). For man, it first goes up at the third quartile (0.9852) and then goes down to its bottom also at Q95 (0.0939). It suggests the enhance effect to male earnings is higher than that to female, although both coefficient decrease. The improvement to earnings may partly because when workers have child, they also grew old and accumulated more work experience, not purely for having child. But this trend still makes sense. And for higher earning women (above Q75), having a little child may drag down their earnings because the coefficient is negative. And the more they earned, the greater they will sacrifice. The biggest gap between genders happened in the third quartile, for man the coefficient is 0.9852, for women it is - 0.0362. In 2007, it is not significant of the gender differential in return coefficient, the highest occurs at the Q10 (0.0396) for male and Q95 (0.1093) for female, the lowest emerges at Q95 (-0.0736) for men and Q10 (-0.1981) for women. But when comparing with that in 2002, it changes enormously no matter from the absolute value or from the trend. Male workers don't earn more than females from having a little child. On the contrary, both of the effects for female and male are negative and no distinct difference.

FIGURE 5. Return to Young Child in family between Genders



In short, the gender comparisons (figure 2-5) provided by RIF unconditional quantile regression demonstrates significant changes have taken place since 2002. Education, although is still essential to women, not as much rewarding as in 2002. Similarly, the promotion effect of work experience declines largely and turns out to be negative to higher earnings of female

(above P75). Married status is no longer help men gain more from labour market. On the contrary, female obtains almost the same with male in middle-earnings group and even more than male in higher (Q75) or lower (Q25) earnings groups. The gender differential of effect to have little child is not as significant as before, and presents a negative impact to their earnings for both.

4. CONCLUSIONS

Market-oriented economic reform, which began in 1978, has gone through several key stages to bring substantial changes to current Chinese economy. It has accelerated after 1992, and after President Hu Jintao formulated ‘scientific outlook of development’ and ‘harmonious society’, it gradually reached an agreement of the pattern transformation of economic development in China. During this dramatic and complicated economic transitional process, earnings distribution and gender inequality in labour market kept attracting attention from the international and domestic.

To make a comprehensive understanding of the women earnings situation in China, it adopted the two-step procedure of RIF unconditional regression to examine the gender discrimination degree and returns to personal characteristics at various quantile. The advantage of this methodology is that it could not only decompose the unconditional earnings change at any quantile in the earning distribution, but also allows estimating the contribution of individual covariates to each component. In this research, it mainly focuses on four personal characteristics, ‘years of schooling’, ‘work experience’, ‘marriage’ and ‘having young child in family’.

After analysing the samples from Chinese income household project 2002 and 2007 by RIF, the results show that both the overall gender earnings gap and unexplained gender earning gap has increased since 2002. And the earnings gap is more significant at the higher earnings group. It also featured a large change in terms of contributions for different individual variable to earnings. For education, although it is still essential for female, it is not as much rewarding as in 2002. It is the same to work experience, its promotion effect declines heavily and even turns out to be negative to higher earnings of female (above P75). In these two sections, the changes for male are not very noticeable.

As to the marriage effect, big gender gaps exist in the lower and higher earnings group. Married status still works helping men to acquire more than women from labour market. But to middle earnings groups, the effect is almost the same. For the effect of having little child in family, its differential returns between genders is not as significant as before, and presents a wholly negative effect for both.

Reference:

- Albrecht, James, Anders Björklund, and Susan Vroman. 2003. "Is There a Glass Ceiling in Sweden?" *Journal of Labor Economics* 21(1):145-77.
- Appleton, Simon, John Knight, Lina Song, and Qingjie Xia. 2005. "Has China Crossed the River? The Evolution of Wage Structure in Urban China during Reform and Retrenchment " *Journal of Comparative Econometrics* 33(4):644-63.
- Barsky, Robert, John Bound, Kerwin Kofi Charles, and Joseph P. Lupton. 2002. "Accounting for the Black-White Wealth Gap: A Nonparametric Approach." *Journal of the American Statistical Association* 97(459):663-73.
- Berik, Günseli, Yana van der Meulen Rodgers, and Joseph E. Zveglic. 2004. "International Trade and Gender Wage Discrimination: Evidence from East Asia." *Review of Development Economics* 8(2):237-54.
- Bishop, John A., Feijun Luo, and Fang Wang. 2005. "Economic Transition, Gender Bias, and the Distribution of Earnings in China." *Economic of Transtion* 13(2):239-59.
- Blau, Francine D., and Lawrence M. Kahn. 2000. "Gender Difference in Pay." *The Journal of Economic Perspective* 14(4):75-99.
- Chi, Wei, and Bo Li. 2008. "Glass Ceiling or Sticky Floor? Examining the Gender Earnings Differential across the Earnings Distribution in Urban China, 1987–2004." *Journal of Comparative Economics* 36(2):243-63.
- Chi, Wei, Bo Li, and Qiumei Yu. 2011. "Decomposition of the Increase in Earnings Inequality in Urban China: A Distributional Approach." *China Economic Review* 22(3):299-312.
- Clark, Shirley M., and Mary Corcoran. 1986. "Perspectives on the Professional Socialization of Women Faculty: A Case of Accumulative Disadvantage?" *The Journal of Higher Education* 57(1):20-43
- Deng, Quheng, and Shi Li. 2009. "What Lies behind Rising Earnings Inequality in Urban China? Regression-based Decompositions." *CESifo Economic Studies* 55(3-4):598-623.
- DiNardo, John, Nicole M. Fortin, and Thomas Lemieux. 1996. "Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach." *Econometrica* 64(5):1001-44.
- Firpo, Sergio, Nicole M. Fortin, and Thomas Lemieux. 2007. "Decomposing Wage Distributions Using Recentered Influence Function Regressions." *Unpublished Manuscript, University of British Columbia*.
- . 2009. "Unconditional Quantile Regressions." *Econometrica* 77(3):953–73.
- Ge, Yuhao, Hongbin Li, and Junsen Zhang. 2011. "Gender Earnings Gaps in Hong Kong: Empirical Evidence from across the Earnings Distribution in 2006." *China Economic Review* 22(1):151-64.
- Gustafsson, Björn, and Shi Li. 2000. "Economic Transformation and the Gender Earnings Gap in Urban China." *Journal of Population Economics* 13(2):305-29.

- LI, Liying, and Xiaoyuan DONG. 2011. "Economic Transition and the Gender Earnings Gap in Chinese Industry: the Role of Firm Characteristics " *Contemporary Economic Policy* 29(1):67-87.
- Liu, Pak-Wai, Xin Meng, and Junsen Zhang. 2000. "Sectoral Gender Wage Differentials and Discrimination in the Transitional Chinese Economy." *Journal of Population Economics* 13(2):331-52.
- Lundberg, Shelly, and Elaina Rose. 2000. "Parenthood and the Earnings of Married Men and Women." *Labour Economics* 7(6):689-710.
- Maurer-Fazio, Margaret, and James Hughes. 2002. "The Effects of Market Liberalization on the Relative Earnings of Chinese Women." *Journal of Comparative Economics* 30(4):709-31.
- Meng, Xin., and Paul. Miller. 1995. "Occupation Segregation and Its Impact on Gender Wage Discrimination in China Rural Industrial Sector." *Oxford Economic Papers-New Series* 47(1):136-55.
- Ng, Ying Chu. 2007. "Gender Earnings Differentials and Regional Economic Development in Urban China, 1988–97." *Review of Income and Wealth* 53(1):148-66.
- Oaxaca, Ronald. 1973. "Male-Female Wage Differentials in Urban Labor Market." *International Economic Review* 14(3):693-709.
- Pollmann-Schult, Matthias. 2011. "Marriage and Earnings: Why Do Married Men Earn More than Single Men?" *European Sociological Review* 27(2):147-63.
- Sakellariou, Chris. 2012. "Unconditional Quantile Regressions, Wage Growth and Inequality in the Philippines, 2001-2006: the Contribution of Covariates." *Applied Economics* 44(29):3815-30.
- Schneider, Daniel. 2011. "Market Earnings and Household Work: New Tests of Gender Performance Theory." *Journal of Marriage and Family* 73(4):845-60.
- Waldfogel, Jane. 1998. "Understanding the "Family Gap" in Pay for Women with Children." *The Journal of Economic Perspectives* 12(1):137-56.
- Zhang, Junsen, Jun Han, Pak-wai Liu, and Yaohui Zhao. 2008. "Trends in the Gender Earnings Differential in Urban China, 1988-2004." *Industrial and Labor Relations Review* 61(2):224-43.
- Zhang, Liqin, and Xiao-Yuan Dong. 2008. "Male–Female Wage Discrimination in Chinese Industry Investigation Using Firm-Level Data." *Economics of Transition* 16(1):85-112.
- Zhang, Yuping, Emily Hannum, and Meiyan Wang. 2008. "Gender-based employment and income differences in urban China: Considering the contributions of marriage and parenthood." *Social Forces* 86(4):1529-60.