

Economic Transition, Gender Bias, and The Distribution of Earnings in China

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Abstract. Market-oriented economic reform, which accelerated after 1992, has brought substantial changes to the Chinese economy. This dramatic economic transition leads to two important questions: “How are women faring in the transition from a planned economy to a market economy?” and “Are some women faring relatively better than other women?” We use data from the Chinese Household Income Projects for the years 1988 and 1995, a standard earnings equation, and quantile regressions to estimate and decompose the earnings gap. Our findings suggest that while the earnings gap has increased, the fraction of the gap “unexplained” by differences in human capital variables such as education and experience has declined over time. This result is particularly pronounced for low earnings women.

Key Words: Economic transition, earnings gap, quantile regression

JEL Codes: P3, J3, J7

I. Introduction

Market-oriented economic reform, which began in 1978, has brought varied and substantial changes to the Chinese economy. The pace of reform greatly accelerated after Deng Xiaoping's famous 1992 southeastern tour and 14th Communist Party Congress. Changes in the wage system are the most noticeable. Before the reform, China was a centrally planned economy in which non-market mechanisms were used to allocate labor and set wages. After the reform a more market-oriented economic system emerged. This dramatic economic transition leads to two important questions: "How are women faring in the transformation from a planned economy to a market economy?" and "Are some women faring relatively better than other women"?

This paper investigates the gender gap using quantile regressions to model the marginal earnings distribution as a function of workers' characteristics at different earning levels. Kidd and Meng (2001) study the period 1981 to 1987 and find a small increase in wage discrimination. Similarly, Gustafsson and Li (2001) find a slight increase the average gender earnings gap between 1988 and 1995. Furthermore, Maurer-Fazio and Hughes (2002) find no evidence to support the hypothesis that liberalization has lead to a reemergence of discrimination against women.

While these papers address interesting questions, none reach beyond the average and identify how women are faring relative to men at various points on the earnings distribution. We use quantile regression and modify the standard Oaxaca decomposition to determine the gender earnings gap components along the earning distribution.¹ The standard decomposition pays little attention to the underlying earnings distribution. Such

¹ Garcia, Hernandez, and Lopez-Nicolas (2001) use quantile regression in a gender gap study and find that the absolute wage gap of the Spanish workers increases with the pay scale. Claudio Montenegro (2001) uses quantile regression approach to analyze the gender differential in the returns to education and experience and gender wage differentials in Chile. The results show systematic gender differences in the returns to education and experience along the conditional wage distribution.

decomposition may show that the average male receives an earnings premium, but these averages are not necessarily representative of the earnings gaps at different quantiles of the earnings distribution. In fact, our findings suggest that the “unexplained” gender gap for low-earnings women is much larger than the average earnings gap predicted using standard methods.

The rest of the paper is organized as follows: Section II briefly discusses the changes in the Chinese economy between 1988 and 1995, the period covered by our data. Section III describes the data, gives a brief introduction to the methodology of quantile regression and wage decomposition, and presents our empirical model specification. Section IV presents the empirical results, and Section V concludes.

II. The Chinese Economy and Labor Market Reform, 1988 – 1995

The Chinese economy experienced very rapid growth between 1988 and 1995. According to the *China Statistical Yearbook* nominal GDP quadrupled and the average annual real GDP growth rate exceeded eight percent. Over the same time period, nominal wages tripled and average annual real wage growth was just under five percent. The inflation rate varied widely, falling as low as 1.3 percent in 1990 and as high as 25 percent in 1994. Overall the price level more than doubled between 1988 and 1995.

Along with, or as a result of, these macroeconomic changes came important labor market reforms. Meng (2000) provides an excellent survey of recent labor market reforms in urban China. She states that “the weaknesses of pre-reform labor arrangements in China were twofold (p. 81),” the lack of labor mobility and that individual’s were paid according to their qualifications (age and education) rather than their actual labor productivity. While there no doubt about the lack of mobility, it is not at all clear that people were paid according to their qualifications, especially their level of

education. Gustafsson and Li (2001, p. 187) review the pre-reform literature and state the “although not zero, rates of return to education in China have been low.”

According to Meng (2000) the labor contract system was introduced in order to change the lifetime employment system. The contract system allows firms to use examinations and interviews to hire suitable individuals. While more flexible than the old system, workers could not resign to take a better job and until the early 1990’s employers “could not dismiss employees on the grounds of over-staffing (p.82).” Meng’s Table 6.1 shows that contract employees increased from 3.7 to 39.0 percent of workers between 1985 and 1995.

Efforts were also made to reform the wage setting system. Two major reforms were implemented [c.f., Kidd and Meng (2001); Meng (2000)]. First, the size of the wage bill was allowed to vary with productivity. The second reform was the use of the “wage plus bonus system” [Meng (2000), p. 83]. This is an attempt to link wage to actual productivity. Kidd and Meng (2001, p. 409) argue that there is little consensus on the impact of the reforms on the gender gaps.

These changes in the Chinese economy have been accompanied by substantial changes in the distribution of earnings in China. Bishop and Chiou (2004) report an increase in the earnings Gini coefficient of inequality from 0.2241 to 0.2799 between 1988 and 1995. This change of nearly 25 percent is large in comparison to the highly publicized ten percent increase in inequality that occurred in the US in the late 1970’s. This dramatic shift in the distribution of earnings motives our use of quantile regression to study the gender earnings gap at not just the mean, but all along the earnings distribution.

II. Data and Methods

We obtain our data from the Chinese Household Income Projects, 1988 and 1995. The surveys, conducted by Carl Riskin, Zhao Renwei and Li Shi, are intended to estimate the distribution of income in both rural and urban areas of the People's Republic of China. The data of both surveys consist of urban and rural population samples of the People's Republic of China, which were selected from significantly larger samples drawn by the State Statistical Bureau.

We restrict our samples to the urban area population (due to lack of earnings data for rural farmers) and focus on those whose ages are between 18 years and 60 years with positive earnings as well as some labor market experience during the survey year. We define earnings as the sum of regular wages, floating wages, all kinds of bonuses, subsidies, cash income and allowances. There are 17,558 observations for 1988 and 11,927 observations for 1995.² Regional observations for 1988 vary from 385 females in Beijing to 1068 males in Guangdong Province. For 1995, regional observations vary from 285 females in Gansu Province to 670 males in Liaoning Province.

Several data limitations need to be noted. First, of all, our data does not include migrants from rural areas. These illegal workers are those most likely to be discriminated against in the labor market. Second, both of our samples are made up almost entirely of public employees and workers at state owned enterprises. This is both a limitation--we cannot examine discrimination across employment types³--and a benefit in that we are comparing the change in discrimination over time among state sector employees.

² Gustafsson and Li (2001) also use the CHIP data but report slightly different sample sizes, 17,887 cases for 1988 and 10,614 cases in 1995. The differences in mean earnings and male/female earnings ratios between the two samples are very small. To compute real earnings we use the change in the urban CPI of 2.28 given by Khan and Riskin (2001, Table 2.2).

³ A related body of literature address how well women have fared in the transition out of the state sector, e.g., Maurer-Fazio and Hughes, (2002), Dong and Bowles (2001), and Liu, Meng and Zhang (2000). As our data is almost entirely made up of state sector employees we focus on discrimination over time in the State sector.

Thirdly, our data covers the period before the policy of “Grasping the big, let go the small” (Meng, 1998, p.1). This is the downsizing of state owned enterprises (SOE).⁴

Table 1 presents descriptive statistics by gender. We find little change in the male-female earnings ratio over time; males earn 19 percent more than females in 1988 and 20 percent more than females in 1995.⁵ There is some variation in the male-female ratio across regions but there is no indication that regional variation in this ratio is increasing over time. Notably, both males’ and females’ real earnings increased by 50 percent during the period 1988-1995.

Given the labor market reforms we anticipate a change in the earnings composition over time. Workplace subsidies, which comprised 23 percent of earnings for both males and females in 1988 fell these subsidies fall to 17 percent for males and 19 percent for females in 1995. As suggested by Meng (2000) we find an increase in bonuses for both males and females from eight percent to 16 percent. We find significant variation in earnings growth by regions. Earnings grew much faster than average in Beijing, Guangdong and Jiangsu provinces and much slower than average in Gansu Province. There is little variation in growth rates across gender with the exception of Anhui Province where female incomes grew by two-thirds and male incomes grew by only one-third.

Table 1 also provides measures of experience and education. Male workers have an average of two more years of experience than females in 1988. Both male and female workers have one less year of experience in 1995 and the gender gap in experience falls to 1.7 years. Schooling increased dramatically for both males and females between 1988

⁴ Meng (1998) states that 12 million urban workers were laid off in 1997 under this policy. For a recent summary of downsizing policies, see Dong (2003).

⁵ Kidd and Meng (2001) find a stable male-female earnings ratio (approximately 1.14) for the period 1981–1987.

and 1995, although female education levels continue to lag those of males by 0.65 years. By 1995 the typical male worker had a high school education (12.1 years) and the typical female worker just less than a high school degree (11.5 years).

We measure family status using marriage and the presence of small children. The percent of the sample married increases from 78 percent in 1988 to 87 percent in 1995. We also note a remarkable decline in the presence of small children in the household from 11 percent in 1988 to three percent in 1995. This change is clearly a result of China's "One-Child Policy."

In 1988, males are more likely to be factory managers, government officials, and office workers, while females are more prevalent in manual labor jobs. We can also see that males are more likely to be distributed in certain economic sectors such as agriculture, mining, construction, transport and communications, and science and technology while females are more likely to be found in trade and restaurant, personal services, health and social welfare, and education and cultural sectors. For 1995, more workers are professionals, office heads, and office workers while fewer worked as unskilled laborers. Females are more likely to be private owners and institution heads; however, we note a higher proportion of unskilled female manual laborers in 1995 than in 1988. For both 1988 and 1995 we find about one-third of male workers are Party members. In contrast, the percent of female workers who are Party members increased from 12 percent to 15 percent.

The Quantile Regression Model

To analyze earning differentials, we use the standard model based on the human capital earnings function developed by Mincer (1974):

$$\ln(Y_i) = \varphi(X_i) + \mu_i \tag{1}$$

where $\ln(Y_i)$ is the natural logarithm of the earning for observation i , and X_i is a vector of characteristics including a measure of schooling, experience, gender, occupational indicators, economic sector indicators, and regional indicators. Traditionally, the Mincerian earnings equation is estimated using ordinary least squares (OLS), which characterizes the wage distribution only at the mean of the distribution. A weakness of the OLS method is that it cannot uncover the effects of the independent variables on the “shape” of the distribution. For example, the rate of return to schooling might not be identical at all earnings levels. The advantage of quantile regression (see Koenker and Bassett, 1978; Koenker and Hallock, 2001) is that models can be estimated at the conditional median as well as at other conditional quantiles.

Following Koenker and Bassett, the earnings of a worker is in the τ th quantile if his earning is higher than the proportion τ of the reference group of workers and lower than the proportion $(1-\tau)$. Hence, half of the workers have higher earnings than the median worker and half have lower earnings. The procedure can be generalized to quartiles, quintiles, or the percentiles.

Classical linear regression is a method of estimating conditional mean functions by minimizing sums of squared residuals, which is an extension of the idea of estimating an unconditional mean parameter. Similarly, quantile regression could be viewed as an extension of univariate quantile estimation to the conditional quantile estimation using an optimization of a piecewise linear objective function of residuals. The median regression method, also known as least absolute deviation (LAD) estimator, fits the regression line that minimizes the sum of absolute residuals instead of the sum of squared residuals. Since the solution to the problem of minimizing a sum of absolute residuals yields the

median, minimizing the sum of asymmetrically weighted absolute residuals yields the quantiles. Thus,

$$\min_{\beta \in \mathbb{R}^p} \sum \rho_{\tau}(y_i - \xi(x_i, \beta)), \quad (2)$$

where the function $\rho_{\tau}(\bullet)$ is the absolute value function that yields the τ th sample quantile and $\xi(x_i, \beta)$ is the linear function of parameters. By estimating an entire range of conditional quantile functions, quantile regression offers a more complete statistical analysis than ordinary least squares.

Model Specification

We model log earnings separately for males and females as a function of the following variables:

- i) years of schooling
- ii) potential experience, which is age – years of schooling – 6 and experience squared
- iii) marriage, equal 1 if married, 0 otherwise
- iv) presence of child less than three years old, equal 1, 0 otherwise
- v) party membership, 1 is a party member, 0 otherwise.
- vi) indicator variables for occupation (laborer omitted), sector (manufacturing omitted) and region (Jiangsu Province omitted).⁶

We anticipate that schooling and experience are positively related to earnings. Marriage is typically assumed to increase male earnings, as men work harder and are more productive when they are married. Marriage is assumed to have a smaller impact on

⁶ Our model differs somewhat that used by Gustafsson and Li (2001). We chose experience and years of schooling instead of a set of age and educational indicator variables for presentational economy (given our use of quantile regressions). Kidd and Meng (2001) use experience and education level indicators.

women's earnings as some women may reduce their market labor supply after marriage. The presence of a small child in the household is assumed to reduce female earnings as they shift their efforts toward home production and a positive impact on men as substitute more effort for the reduction in female labor supply. Party membership is expected to be positively related to earnings for several reasons. First, Party membership may be a proxy for unobserved human capital. Second, membership in the party may expose one to training and contacts that make one more productive. Third, Party membership is required for the highest positions in government. Finally, Party membership may provide rent-seeking opportunities that enhance earnings.

Decomposition

One of the most common methodologies for determining earnings differentials by gender was developed by Oaxaca (1973) and Blinder (1973). This method distinguishes between the unequal treatment of females outside the labor market (differentials in variables) from the unequal treatment inside the labor market (differentials in coefficients). The average unadjusted logarithmic differential in gender earnings may be decomposed into an “explained” portion and an “unexplained” portion, which represents the same characteristics being rewarded differently:

$$\overline{\ln Y_m} - \overline{\ln Y_f} = (\overline{X_m} - \overline{X_f})\hat{\beta}_m + (\hat{\beta}_m - \hat{\beta}_f)\overline{X_f}, \quad (3)$$

or

$$\overline{\ln Y_m} - \overline{\ln Y_f} = (\overline{X_m} - \overline{X_f})\hat{\beta}_f + (\hat{\beta}_m - \hat{\beta}_f)\overline{X_m}, \quad (4)$$

where m stands for the male worker, f stands for the female worker, X is a vector of the characteristics of the workers, and $\hat{\beta}$ is a vector of the estimated coefficients. The first term on the right-hand side stands for the earnings differential explained by the

characteristics differential, while the second term is usually interpreted as discrimination because it represents different returns for the same characteristics.⁷ The decomposition is performed based on the assumption that the “discriminated” group should be paid the same as another group, which means that males and females with the same characteristics, such as education, experience, occupation, etc., should earn the same. Equation (3) assumes that the returns to characteristics for males should be the “true” coefficient given certain characteristics, while equation (4) assumes returns to characteristics for females are the true betas.

The standard decomposition above, however, pays little attention to the underlying earnings distribution.⁸ Such decomposition may show that the average male receives an earnings premium, but these averages are not necessarily representative of the earnings gaps at different quantiles of the earnings distribution. In fact, the size of the earnings gap and the factors that explain it may vary at different earnings levels.

The basic quantile regression model specifies the conditional quantile as a linear function of covariates. For the conditional earnings distribution, the formal econometric representation is given by

$$\ln Y_i = X_i' \beta_\tau + u_{i\tau} \quad (5)$$

$$Q_\tau(\ln Y_i | X_i) = \ln Y_i^\tau = X_i' \beta_\tau, \quad (6)$$

assuming that the τ th quantile of the error term, conditional on X_i , is zero. Under this representation, the measure of discrimination for different quantiles can be given as

$$\hat{Q}_\tau(\ln Y_m | X_i) - \hat{Q}_\tau(\ln Y_f | X_i) = X_i' (\hat{\beta}_m - \hat{\beta}_f), \quad (7)$$

⁷ We use the term “discrimination interchangeably with the term “unexplained wage gap.”

⁸ Gustafsson and Li used Jenkins’s (1994) method for analyzing discrimination that differently weights different portions of the earnings distribution but does not directly measure discrimination at various points in the distribution.

where we compare the quantiles of the two earnings distributions of males and females conditional on the same set of characteristics as an approximation to the unobservable measure, as adopted by Garcia, Hernandez and Lopez-Nicolas (2001). The basic assumption for the standard Oaxaca decomposition is that the male beta is true, which is very restrictive. The male coefficient might increase and female coefficient might decrease in the presence of discrimination. The true beta might be somewhere between the male beta and female beta. The choice of X_i is somewhat arbitrary. To decompose the earnings gap we use the average characteristics around a symmetric neighborhood of every quantile. However, the patterns do not show much difference when we use the overall sample mean.

III. Empirical Results

We estimate the earnings equation for different values of τ , 10%, 25%, 50%, 75% and 90%, separately for both males and females. We also estimate the traditional OLS regression for comparison. We are particularly interested in the influence of experience, marital status, the presence of small children, years of schooling, and Party membership therefore we include only the above coefficient estimates in Table 2.⁹ Figures 1-4 illustrate the returns to those characteristics for males and females.

We can illustrate the advantage of quantile regression over traditional OLS methods by examining the returns to experience. Figure 1 examines the pattern of returns to experience evaluated at 10 years of experience.¹⁰ For both genders and years returns to experience decline as we move up the earnings distribution. Figure 1 illustrates that the

⁹ A complete set of regression coefficients and decomposition results are available on request.

¹⁰ We also estimate the return to experience of 20 years using quantile regression, which shows similar results for both years examined.

return to 10 years of experience is consistently higher for females than males in 1995. Women's gains from experience decline sharply from 81 percent at the first decile to 21 percent at the ninth decile. The males show a similar decreasing pattern but at a slower rate, with 32 percent at the first decile to six percent at the ninth decile. Clearly, low earnings females gained the most from experience.

Figure 2 examines the impact of marriage on the earnings distribution. For 1988, both sexes show positive and declining returns to marriage as earnings increase. While the OLS estimate for males is 24 percent, quantile returns to marriage vary from 36 percent to 16 percent. The female OLS estimate of 14 percent hides the variation by quantile from 24 percent to nine percent.

For males the pattern of returns in 1995 is similar to that of 1988. However, this is not the case for females. The return to marriage for women is not significantly different from zero for the bottom half of the earnings distribution. Only the highest earnings women (ninth decile) saw no significant decline in the marriage coefficient between 1988 and 1995.

We also considered the impact of the presence of a child less than three years old in the household (not shown in the figures). For females, the presence of small children reduces earnings between three and seven percent in 1988 and has no statistically significant effect in 1995. Likewise for males there is little impact on earnings due to the presence of small children. The exception is in the lowest decile of 1995, where the presence of a small child raises earnings by approximately 13 percent. We note that this

impact at the first decile is sufficient to produce an OLS estimate of 10.20 percent. Again, this finding highlights the advantage of quantile regression.¹¹

Figure 3 plots the returns to education for 1988 and 1995. In 1988 there is very little difference between male and female educational returns and educational returns vary little by earnings quantile. This is not the case for 1995. Females earn substantially more than males for an additional year of schooling at all earnings quantiles and returns to education decrease for both sexes as earnings increase. The greatest difference between genders is found at the tails of the distribution; females with the lowest and highest earnings enjoy much greater returns to schooling than their male counterparts.

Table 2 also provides estimates of the impact of Party membership on earnings (Figure 4). For 1988 female Party members earn on average (OLS estimate) 13 percent more and males Party members four percent more than non-Party members, with only a small degree of variation across quantiles. For 1995, male Party returns are highest for those at the bottom of the earnings distribution (12 percent) and statistically insignificant at the ninth decile. For females, Party returns vary from more than nine percent to 2.2 percent. Thus, low earnings workers benefit the most from Party membership and for males this benefit has been growing over time.¹² In contrast, high earnings workers gain almost no earnings benefit from Party membership in 1995.

In sum, our regression results suggest that while the OLS results may not adequately represent returns to human capital characteristics in China. These important variations in the regression coefficients along the earnings distribution highlight the advantages of quantile regression.

¹¹ Although in many countries an important reason that women earn less than their male counterparts is that they withdraw from the labor force after the birth of a child, these interruptions are relatively short in urban China. Hence it is not surprising that the effect of childbirth for women is small.

¹² One possible explanation for this finding is that Party membership identifies higher human capital among low education, low earnings workers.

Earnings Gap Decompositions

In this section we use the quantile regression results to perform Oaxaca-type decompositions male-female earnings gap. Tables 3-a and 3-b present the log earnings for males (column 2) and females (column 3) at the mean and the 10th, 25th, 50th, 75th, and 90th quantiles of each sample. The tables also include the unadjusted gender earnings gap (column 4) and the “unexplained” ($X'(\beta_m - \beta_f)$) portion of the earnings gap (column 5). Column 6 provides the ratio of unexplained part of earnings differential to the total earnings gap.

The mean unadjusted earnings gap (column 4) increases from 0.1854 log points in 1988 to 0.2199 log points in 1995. This finding is similar to Gustafsson and Li (2001) who find that “female earnings as a percent of male earnings changed from 84.4 to 82.5 % (p. 194)” over the same time period. We find that the unexplained portion of the earnings gap increases slightly from 0.1323 log points in 1988 to 0.1349 log points in 1995. Gustafsson and Li find a somewhat larger average change from 9.4 percent to 14.7 percent. We note that this may be accounted for by two factors, a slightly different specification of the earnings equation and their use the female X 's as opposed to our use of the mean of both male and female characteristics.¹³

Next we look beyond mean to the earnings gap at the various quantiles. The 1988 unadjusted earnings gap between males and females (column 4) is the highest at the first decile (0.2036) and is smallest at the third quartile (0.1597). The earnings differential unexplained by the observable characteristics (the X 's) between genders is the largest at the lowest earnings level (0.2036) and varies only slightly from approximately nine to

¹³ Kidd and Meng (2001), whose data, like ours, is made up of public employees, also find very little change in earnings discrimination for the period 1981-1987. Dong and Bowles (2001) using 1998 data from two cities, Dalian and Xiamen, find a ten percent wage gap.

eleven percent at the other quantiles. This results in the median unexplained portion of the earnings gap (column 5) to be only about two-thirds of the mean unexplained portion (0.0879 vs. 0.1323).

For 1995 the unadjusted earnings gap varies from 0.3327 at the first decile to 0.1468 at the third quartile. The unexplained part (column 5) varies from 0.2610 at the first decile to 0.0830 at the ninth decile. Thus, the decomposition at the mean underestimates “discrimination” below the median and overestimates “discrimination” above the median and above.

Column 6 provides the ratio of unexplained part of earnings differential to the total earnings gap. This ratio reaches a peak in the bottom quantile of 1988. A ratio of 0.9779 implies that essentially none of the earnings gap between males and females can be explained by the difference in education, experience, family status, Party membership, occupation, employment sector, or region. The lowest ratio in 1988 occurs at the median (0.5220), indicating that about half of the total median earnings differential can be explained by the differences in the characteristics (X 's) of males and females. For 1995, we find less variation in the ratio of the unexplained portion to the total earnings gap (0.7845 at the first decile and 0.5515 at the third quartile).

As noted above, since the ratio of $X'(\beta_m - \beta_f)$ /earnings gap captures the earnings gap resulting from differences in the returns to characteristics based on the same vector of characteristics for both males and females, it is often viewed as evidence of discrimination. At the mean we find a decline in discrimination between 1988 and 1995. However, this decline in discrimination is almost entirely concentrated in the bottom decile of the earnings distribution. In contrast, discrimination actually increased at the

first quartile and median. Clearly, the mean is a misleading indicator of the changes in the gender gap over time.

What factors contribute the most to the closing of the unexplained gender gap among the lowest decile workers? Returning to Table 2 and Figures 1-4 it appears that higher female returns over time to both education and experience for low earnings women are important contributing factors to this decline in discrimination.

IV. Conclusion

Market-oriented economic reform, which accelerated after 1992, has brought varied and substantial changes to the Chinese economy. An egalitarian wage system, which was believed to eliminate or minimize wage differences across occupations and genders, has been replaced with a more market-oriented economic system. This dramatic economic transition leads to two important questions: “How are women faring in the transformation from a planned economy to a market economy?” and “Are some women faring relatively better than other women”?

To address these questions we employ quantile regression to examine returns to human capital characteristics at various quantiles in the earnings distribution. We concentrate on four characteristics, experience, education, marital status, and Party membership. For experience and education we find very little gender difference in returns for 1988. This result changes in 1995, with returns to both characteristics higher for females. Particularly noteworthy are the high returns to female experience at the lowest earnings quantiles.

For both 1988 and 1995 we find that returns to marriage are highest for men and low earnings workers. By 1995 the returns to marriage are low (5 to 8 percent) for all women and are quite high (nearly 45 percent) for low wage men. Female returns to Party

membership decline at every quantile between 1988. Most pronounced is at the top of the earnings distribution where the female return falls from nearly 10 percent in 1988 to just over two percent in 1995. For males, returns to Party membership increased over time for all but the highest paid. In both years males returns to Party are lowest for high earnings workers.

Consistent with previous research, we find a small increase in the earning gap between 1988 and 1995. Our OLS estimates show almost no change in the unexplained portion of the earnings gap over time. This results in a decline in the ratio of unexplained to total earnings gap from approximately 71 percent in 1988 to 61 percent in 1995. Thus, on average, we find a slight decrease in discrimination between 1988 and 1995.

To look beyond the average we use quantile regression estimates to decompose the earnings gap at selected quantiles. We find that discrimination is largest at the lowest quantiles; however, we find evidence that this discrimination against the poorest women is declining over time. Higher female returns over time to both education and experience for low earnings women appear to be contributing factors to this decline in discrimination.

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Table 1-a Descriptive Statistics of Main Variables by Gender – 1988

Variable	Male (n=9114)	Female (n=8444)	M/F Ratio
Earnings	4495	3777	1.19
percent subsidies	23	23	1.00
percent bonus	8	8	1.00
experience	22.8	20.8	1.10
years of schooling	9.6	8.7	1.09
married	0.78	0.78	1.00
Small children	0.11	0.11	0.97
party member	0.34	0.12	2.91
Occupation			
private_owner	0.007	0.004	1.68
private_owner_mgr	0.001	0.001	1.16
prof_tech	0.157	0.159	0.98
Gov't_official	0.075	0.015	4.91
factory_mgr	0.030	0.005	6.61
office_wkr	0.258	0.211	1.22
manual_wkr	0.470	0.596	0.79
Economic Sector			
agriculture	0.011	0.0077	1.44
mining	0.041	0.0219	1.85
manufacture	0.412	0.4467	0.92
geological	0.010	0.0082	1.17
construction	0.041	0.0276	1.48
transportation	0.083	0.0499	1.67
trade	0.111	0.1733	0.64
Real estate_utility	0.015	0.0137	1.08
personal_consulting	0.007	0.0126	0.52
health_sports	0.034	0.0587	0.57
education_culture	0.067	0.0783	0.86
Sci_tech	0.025	0.0155	1.62
finance_insurance	0.016	0.0152	1.02
party official	0.116	0.0505	2.31
other	0.007	0.0071	0.93
Don't know	0.001	0.0024	0.46
Provincial Earnings			
Beijing	4688	4065	1.15
Shanxi	3931	3324	1.18
Liaoning	4353	3826	1.14
Jiangsu	4275	3643	1.17
Anhui	4261	3399	1.25
Henan	3714	3060	1.21
Hubei	4086	3659	1.12
Guangdong	6366	5308	1.20
Yunnan	4767	3928	1.21
Gansu	4317	3491	1.32

Source: Chinese Household Income Project, 1988

Table 1-b **Descriptive Statistics of Main Variables by Gender – 1995**

Variable	Male (n=6222)	Female (n=5705)	M/F Ratio
earnings	6734.7	5592.5	1.20
percent subsidies	17	19	0.89
percent bonus	15	16	0.94
experience	21.5	19.8	1.09
years of schooling	12.1	11.5	1.06
married	0.87	0.88	0.99
small children	0.03	0.03	1.00
party member	0.34	0.15	2.23
Occupation			
owner	0.006	0.005	1.19
manager	0.002	0.001	1.38
professional	0.214	0.228	0.94
dept. head	0.166	0.056	2.94
office worker	0.189	0.219	0.86
skilled	0.249	0.177	1.41
unskilled	0.119	0.217	0.55
other	0.028	0.065	0.44
Economic Sector			
manufacturing	0.418	0.398	1.05
mining	0.012	0.009	1.25
construction	0.032	0.025	1.25
trans_communic.	0.056	0.040	1.40
trade	0.115	0.159	0.72
Real estate	0.031	0.041	0.75
health	0.035	0.057	0.61
education	0.063	0.083	0.76
technical	0.026	0.020	1.26
finance	0.018	0.021	0.84
Gov't	0.134	0.091	1.47
other	0.026	0.018	1.47
Provincial Earnings			
Beijing	9015	7850	1.15
Liaoning	6116	4986	1.23
Henan	5155	4107	1.26
Jiangsu	7223	6030	1.20
Anhui	5554	4346	1.28
Hubei	6223	5510	1.13
Guangdong	12187	10127	1.20
Shanxi	5411	3998	1.35
Gansu	5042	4002	1.26
Sichuan	5206	5275	1.18
Yunnan	6152	5331	1.15

Source: Chinese Household Income Project, 1995

Table 2-a **Quantile Regression Estimates for 1988**

Variables	$\tau=0.10$		$\tau=0.25$		$\tau=0.50$		$\tau=0.75$		$\tau=0.90$		OLS	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
experience	.0263 (.0017)	.0394 (.0031)	.0247 (.0011)	.0302 (.0018)	.0217 (.0013)	.0228 (.0015)	.0198 (.0016)	.0204 (.0016)	.0201 (.0021)	.0171 (.0024)	.0265 (.0015)	.0308 (.0019)
exp2	-.0003 (.0000)	-.0007 (.0001)	-.0002 (.0000)	-.0005 (.0000)	-.0002 (.0000)	-.0003 (.0000)	-.0002 (.0000)	-.0002 (.0000)	-.0002 (.0000)	-.0001 (.0000)	-.0003 (.0000)	-.0005 (.0000)
married	.3608 (.0137)	.2368 (.0235)	.2555 (.0100)	.1788 (.0139)	.2002 (.0113)	.1459 (.0122)	.1854 (.0150)	.1191 (.0137)	.1623 (.0196)	.0864 (.0198)	.2386 (.0134)	.1440 (.0152)
small child	.0083 (.0146)	-.0689 (.0246)	-.0082 (.0099)	-.0573 (.0145)	-.0102 (.0103)	-.0475 (.0121)	.0154 (.0127)	-.0533 (.0127)	-.0038 (.0159)	-.0336 (.0183)	.0085 (.0120)	-.0582 (.0151)
school years	.0161 (.0011)	.0189 (.0022)	.0157 (.0008)	.0155 (.0013)	.0143 (.0008)	.0136 (.0011)	.0146 (.0010)	.0136 (.0012)	.0133 (.0012)	.0130 (.0017)	.0154 (.0010)	.0157 (.0014)
party	.0613 (.0110)	.1321 (.0249)	.0473 (.0025)	.1035 (.0148)	.0364 (.0078)	.0889 (.0125)	.0331 (.0097)	.0952 (.0134)	.0415 (.0122)	.0981 (.0145)	.0434 (.0093)	.1300 (.0155)
R ²	.3604 .2346		.3230 .2256		.2764 .2102		.2481 .1960		.2481 .2020		.4199 .2956	

Notes: a. Standard errors in parenthesis.

b. # stands for not significant at 95% level.

c. Omitted variables: Manual_worker, Manufactures, Jiangsu

Source: Chinese Household Income Project, 1988

Table 2-b **Quantile Regression Estimates for 1995**

Variables	$\tau=0.10$		$\tau=0.25$		$\tau=0.50$		$\tau=0.75$		$\tau=0.90$		OLS	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
experience	.0367 (.0042)	.1040 (.0076)	.0320 (.0028)	.0645 (.00)	.0245 (.0030)	.0456 (.0033)	.0189 (.0036)	.0311 (.0033)	.0143 (.0042)	.0247 (.0043)	0.0274 (.0029)	.0584 (.0037)
exp2	-.0005 (.0001)	-.0023 (.0002)	-.0004 (.0001)	-.0013 (.0001)	-.0003 (.0001)	-.0008 (.0001)	-.0002 (.0001)	-.0005 (.0001)	-.0008 (.0001)	-.0004 (.0001)	-.0003 (.0001)	-.0012 (.0001)
married	.4453 (.0391)	.0483 (.0661)	.2484 (.0251)	.0479 (.0326)	.1467 (.0270)	.0435 (.0281)	.1731 (.0324)	.0668 (.0288)	.1530 (.0397)	.0772 (.0394)	.2387 (.0260)	0.0638 (.0031)
small child	.1286 (.0362)	-.0127 (.0893)	.0981 (.0034)	.0161 (.0452)	.0693 (.0368)	.0021 (.0390)	.0630 (.0450)	.0321 (.0393)	.0406 (.0530)	-.0412 (.0518)	.1020 (.0355)	-.0053 (.0434)
school years	.0377 (.0042)	.0534 (.0085)	.0390 (.0027)	.0471 (.0042)	.0352 (.0029)	.0433 (.0035)	.0285 (.0035)	.0439 (.0036)	.0273 (.0042)	.0434 (.0047)	.0356 (.0028)	0.0443 (.0039)
party	.1208 (.021)	.0940 (.0463)	.0633 (.0138)	.0911 (.0239)	.0655 (.0151)	.0631 (.0203)	.0401 (.0185)	.0420 (.0209)	.0355 (.0228)	.0222 (.0277)	.0739 (.0145)	.0951 (.0228)
R ²	.2480	.2032	.2248	.2133	.2137	.2135	.2140	.2214	.2423	.2407	.3572	.3178

Notes: a. Standard errors in parenthesis.

b. # stands for not significant at 95% level.

c. Omitted variables: unskilled, Manufactures, Jiangsu

Source: Chinese Household Income Project, 1995

Table 3a

Unadjusted Earnings Gaps and Decomposition for 1988

Quantiles	log_earnings_Male	log_earnings_Female	Unadjusted Earnings Gap	“Unexplained” $X'(\beta_m - \beta_f)$	$X'(\beta_m - \beta_f)$ /Earnings Gap
(1)	(2)	(3)	(4)	(5)	(6)
$\tau=0.10$	6.9836	6.7754	0.2082	0.2036	0.9779
$\tau=0.25$	7.2881	7.0961	0.1920	0.1098	0.5719
$\tau=0.50$	7.5247	7.3563	0.1684	0.0879	0.5220
$\tau=0.75$	7.7383	7.5787	0.1597	0.0936	0.5861
$\tau=0.90$	7.9593	7.7836	0.1757	0.1060	0.6033
Mean	7.4923	7.3068	0.1854	0.1323	0.7136

Note: log_earnings_Male and log_earnings_Female are calculated from the observation at the exact quantile.

Source: Chinese Household Income Project, 1988

Table 3-b

Unadjusted Earnings Gaps and Decomposition for 1995

Quantiles	log_earnings_Male	log_earnings_Female	Unadjusted Earnings Gap	“Unexplained” $X'(\beta_m - \beta_f)$	$X'(\beta_m - \beta_f)$ /Earnings Gap
(1)	(2)	(3)	(4)	(5)	(6)
$\tau=0.10$	8.0226	7.6898	0.3327	0.2610	0.7845
$\tau=0.25$	8.3802	8.1513	0.2289	0.1538	0.6719
$\tau=0.50$	8.6995	8.5206	0.1789	0.1026	0.5735
$\tau=0.75$	9.0042	8.8537	0.1505	0.0830	0.5515
$\tau=0.90$	9.2951	9.1484	0.1468	0.0879	0.5988
Mean	8.6664	8.4466	0.2199	0.1349	0.6135

Note: log99_earnings_Male and log_earnings_Female are calculated from the observation at the exact quantile.

Source: Chinese Household Income Project, 1995

Figure 1
Returns to Experience by Gender (10 years experience)

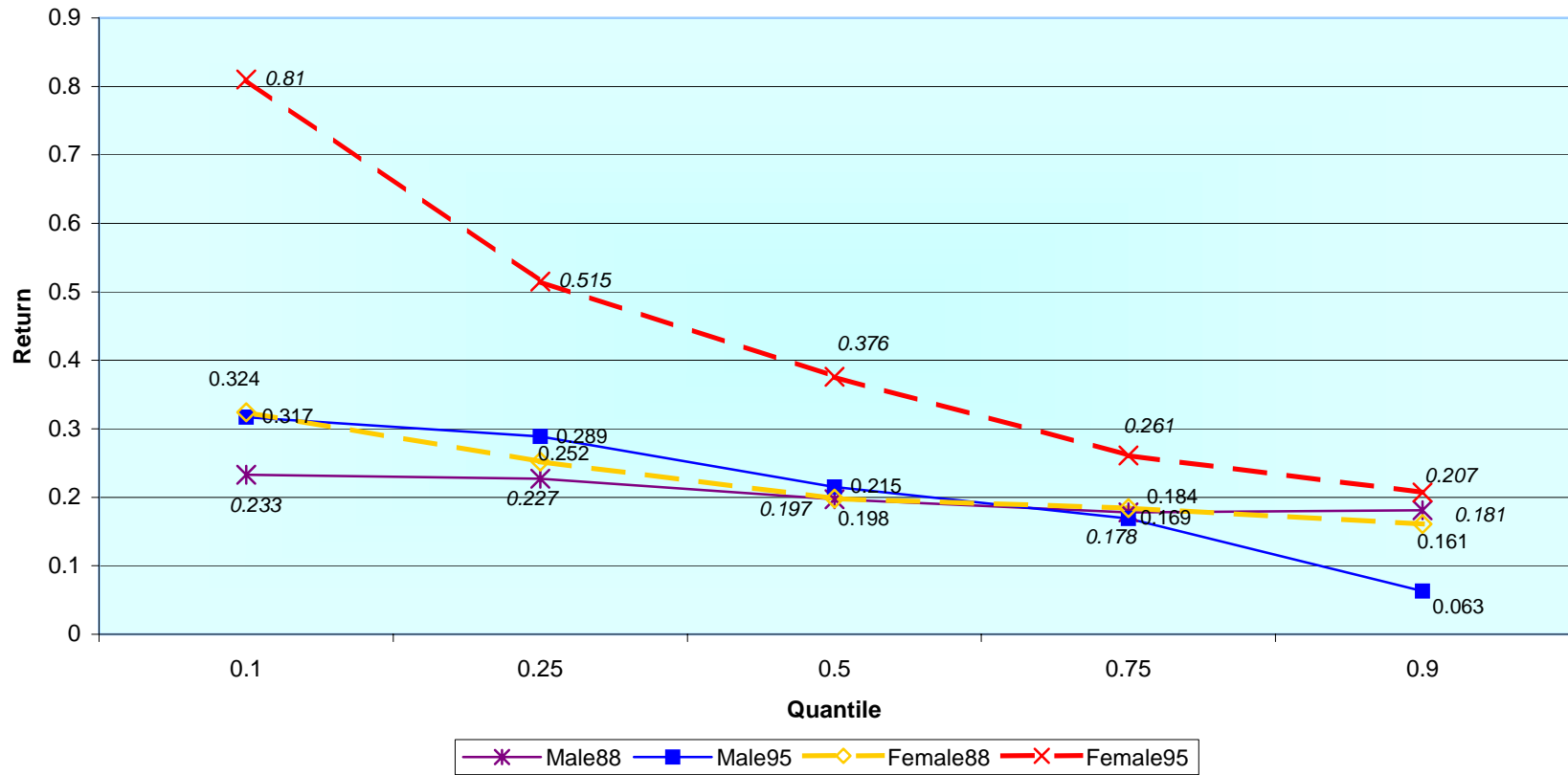


Figure 2
Impacts of Marriage by Gender

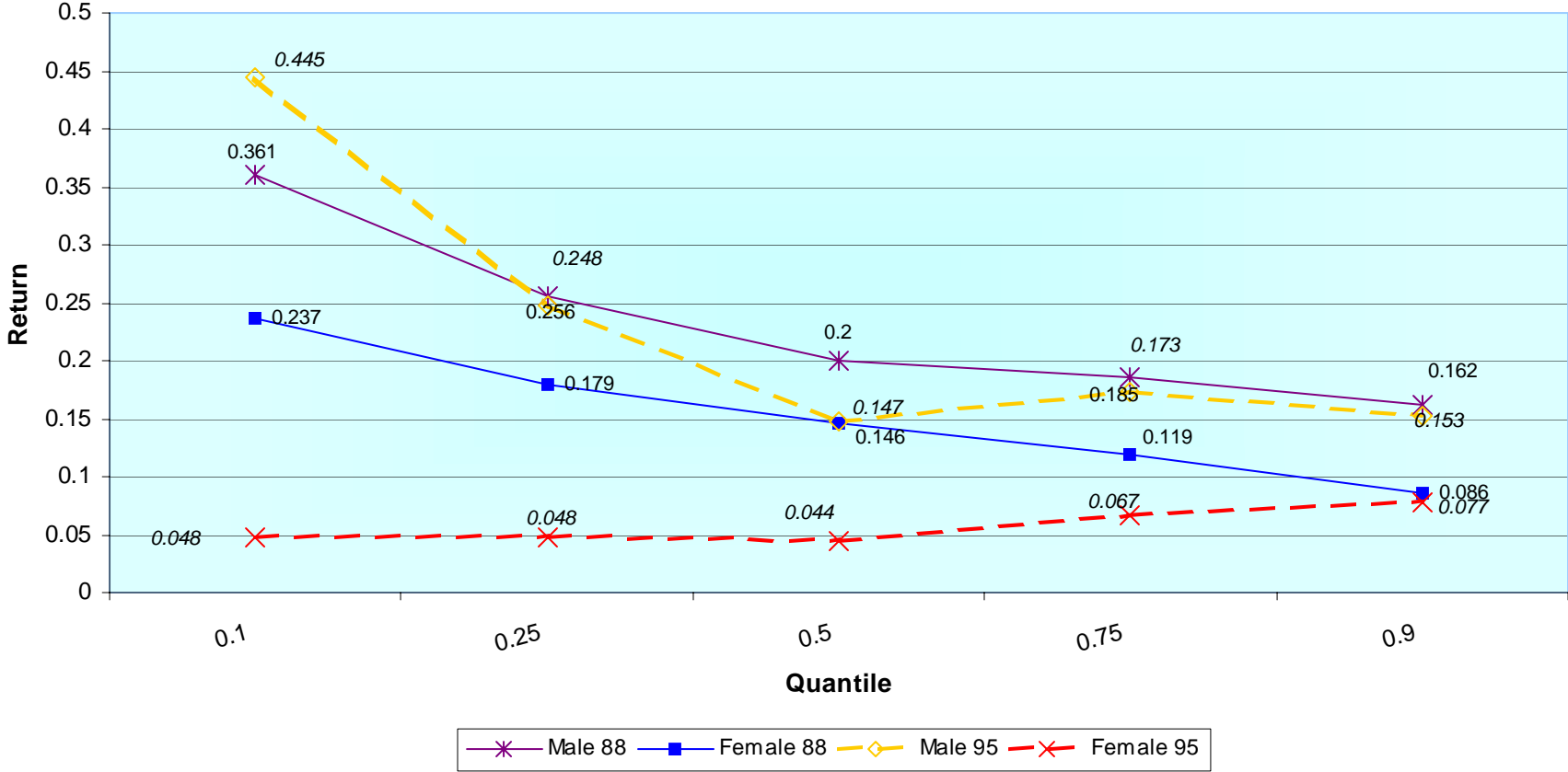


Figure 3
Returns to Education by Gender

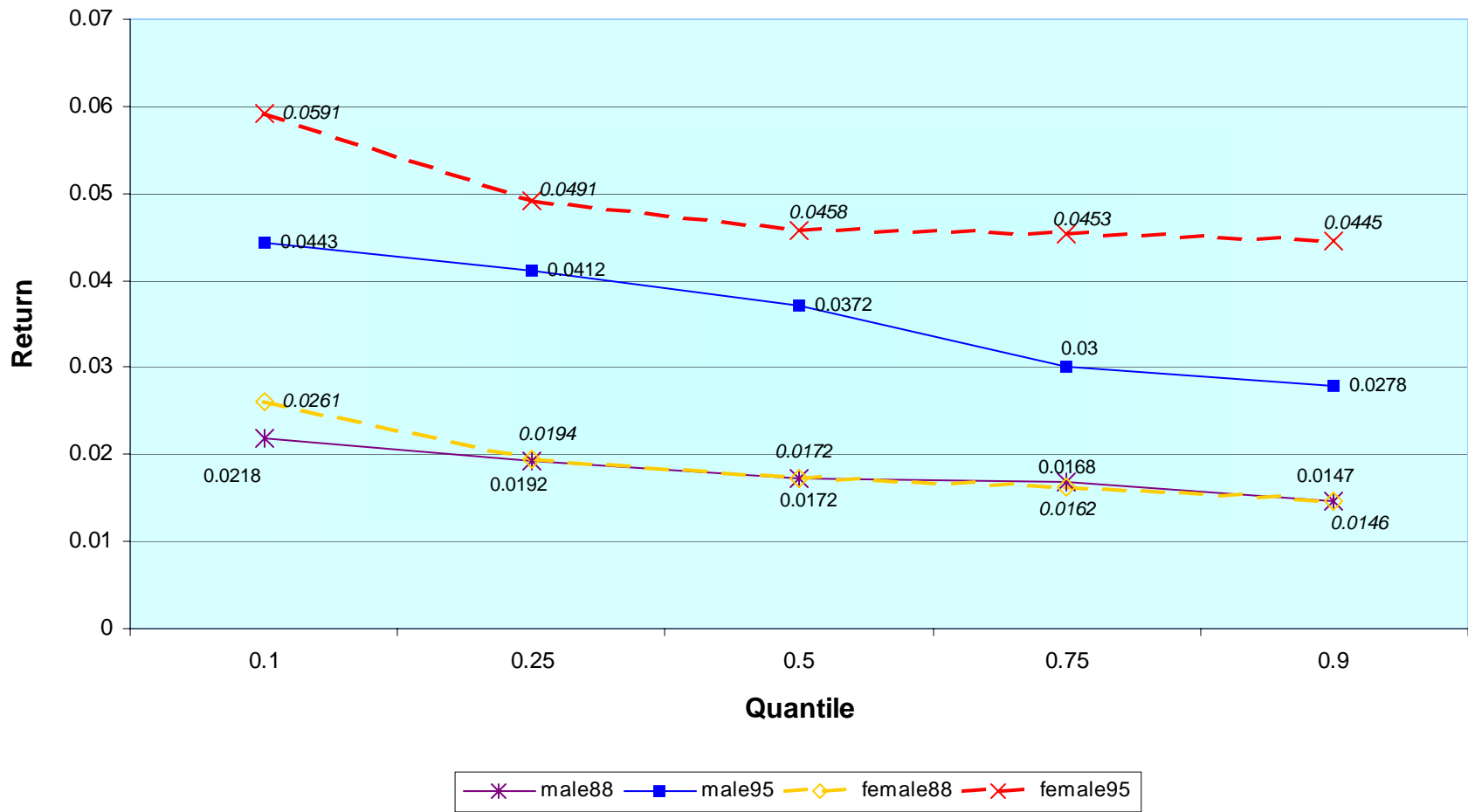


Figure 4
Returns to Party Membership by Gender

