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*Gender Wage Gaps in China's
Labor Market:
Size, Structure, Trends*

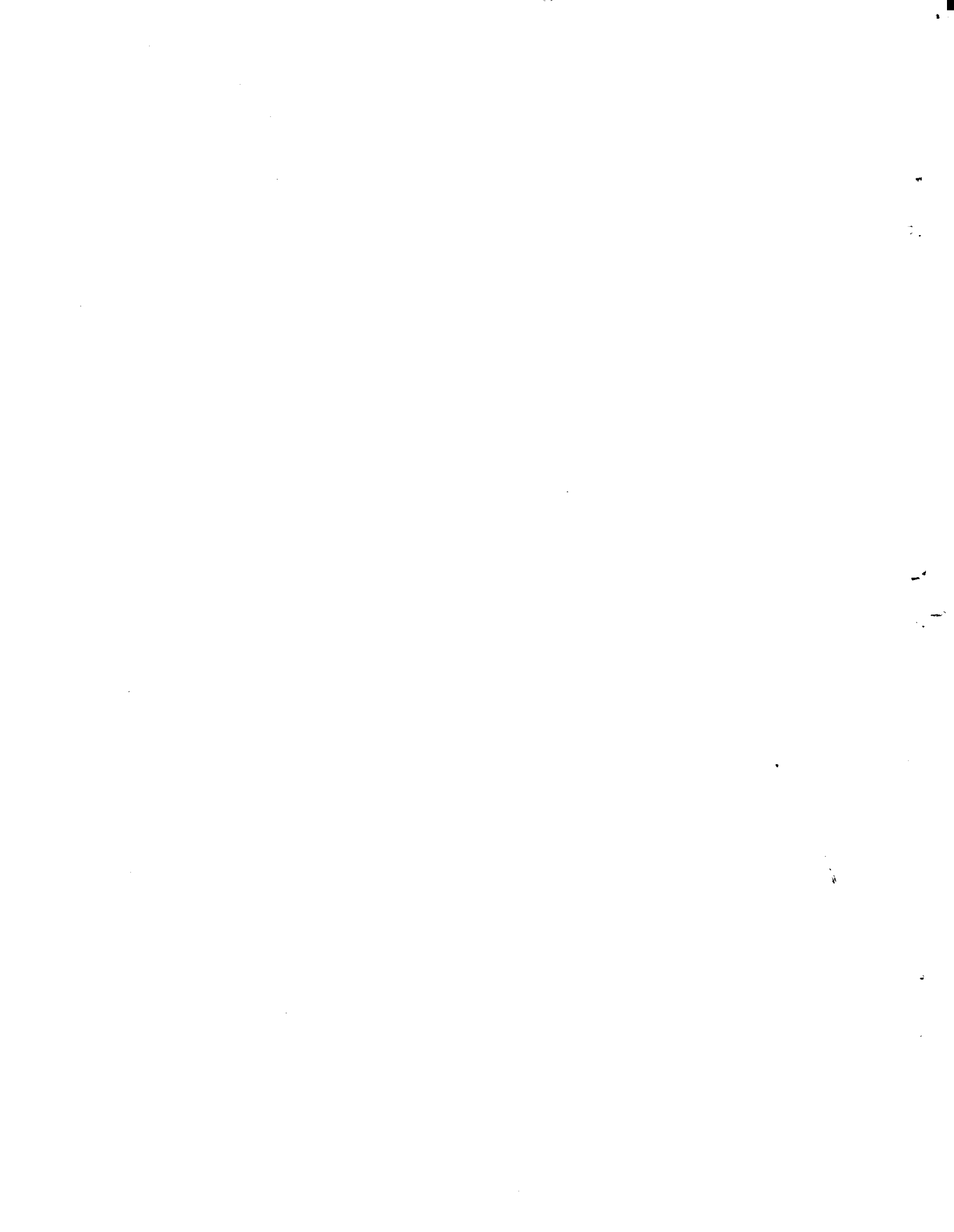
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**GENDER WAGE GAPS IN CHINA'S LABOR MARKET:
SIZE, STRUCTURE, TRENDS**

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GENDER GAPS IN CHINA'S LABOR MARKET: SIZE, STRUCTURE, TRENDS

Abstract

Chinese attitudes toward the treatment of men and women in the workplace reflect two divergent perspectives. The legacy of China's past includes a strong tendency to favor male over female workers, while over the last four decades China's government has vigorously propagated an ideology of gender equality. This paper applies econometric methods to a large body of data on average wages and the number and share of female employees to investigate disparities between men's and women's wages in China's urban, formal labor markets during the period 1988-1994. Our results demonstrate the presence of substantial, persistent, and large (relative to available international comparisons) gaps between men's and women's wages in the People's Republic of China during this period. We find no evidence of a tendency for the gap between male and female wages to decline. On the contrary, calculations based on the whole data set and on data for state and collective employers all indicate expanding inequality between men's and women's earnings.

1. INTRODUCTION

Efforts to delineate cross-national labor market trends must encompass China, home of the world's largest work force. Since China's female work force is comparable to the entire population of the United States, inclusion of China is also essential to comprehending world trends in gender-linked issues. The experience of Chinese women workers reflects a complex interplay between a patriarchal Confucian legacy similar to that observed elsewhere in East Asia and the long-standing official ideology of gender equality encapsulated in the slogan "Women Hold Up Half of Heaven." This inconsistency between official rhetoric and popular custom signals the need for quantitative measures that can illuminate the labor-market treatment of female workers in China.

Statistical information about wages of men and women is not easy to find. Chinese sources, including the massively documented *Industrial Census for 1985* (1988), give no systematic breakdown of men's and women's wages. The same is true of statistical compendia on labor and wages covering 1949-1985 (Labor 1987) and 1978-1987 (Labor 1989), as well as the series of annual volumes on labor and wage statistics beginning in 1989 (Labor annual). The

600-page compendium *Statistics on Chinese Women (1949-1989)* devotes six pages to women's wages; information is limited to a survey of 1,797 workers in 218 enterprises.

Published research reflects this paucity of information. Some authors simply avoid the issue of gender-linked wage differentials. A recent review of "Gender Inequality in Urban China: Education and Employment" (Bauer et al 1992), for example, includes ten tables and nine figures, none containing information on earnings.

Researchers who attempt to address the issue of gender-based income differences typically rely on data generated by survey methods. Given China's vast size and the well-known limitations of Chinese sampling methods (Travers 1982), it is hardly surprising that the resulting studies are filled with contradictions. Female wages are variously placed at 93 percent (Polachek et al 1996), 74-84 percent (Whyte 1984, Khan et al 1992, Meng 1993, Yang and Zax 1996) or 59 percent (HDR 1995) of male earnings. While some surveys suggest that "the overall gap between male and female incomes. . . is particularly narrow at the youngest ages" (Tang and Parish 1995, pp. 9-8; see also Knight and Song 1993, p. 280, Yang and Zax 1996, pp. 21-24), others show a rising gender gap among younger age cohorts (Statistics, pp. 320-321).

Not surprisingly, interpretations of women's position in China's labor markets are equally diverse. Some empirical researchers conclude that China has "by far the smallest gender gap found in the world" (Polachek et al 1996) and that "gender segregation by occupation is minimal" (Tang and Parish 1995, p. IX-7), while others believe that "gender differences with respect to broad occupational categories persist after controlling for age and education" (Bauer et al 1992, p. 365). Tang and Parish (1995, IX-1) see China as approaching circumstances in which "women gain near equality with men in education, work, and income." Meng (1993, pp.20-22) finds that marketization has reduced discrimination against women in China and suggests that liberalization of labor markets will improve women's economic position. But other researchers find persistent male-female differences in bonuses (Bian 1994, p. 172) and total income (Knight and Song 1993, p. 280); Yang and Zax (1996, p. 28) expect women's position in the labor market to deteriorate

with the continuing expansion of the collective sector where they find the largest wage gap and the greatest evidence of gender wage discrimination.

Clarification of the present confusion about the position of women in China's urban labor markets requires information about large populations rather than further analysis of small samples. This is the objective of the present study. Our data come from the annual series of labor and wage yearbooks first issued in 1989 (Labor annual). The data in these yearbooks appear to result from the aggregation of reports prepared by enterprise-level statisticians. Each yearbook contains employment and wage information for many economic sectors, ownership types, and localities. A typical entry would give the average wage, the total number of workers, and the number of female workers for state-owned textile enterprises in Hubei province for 1993.

The intuition underlying our analysis is simple and direct. Each observation shows the proportion of female workers and the average wage of all workers. If men's wages exceed women's wages by a substantial margin, we expect a negative association between the share of female workers and the average wage: the higher the proportion of women, the lower the average wage. With large numbers of observations, econometric techniques should permit us to approximate the size of the gender gap.

Our research builds on this simple logic. We seek sharply focused statistical estimates of the wage gap between China's male and female workers during the period 1988-1994. Do men earn more than women? If so, is the wage gap large or small? Does the male-female wage differential rise or fall over time? To what extent can the wage gap be attributed to factors such as location, economic sector, and type of ownership (state, collective, other), or educational attainments? What is the size and trend of residual male-female inequalities -- the gender gap -- which persist after we apply all available statistical controls?

2. DATA

The principal source for this study is the yearbook on labor and wages, which has appeared annually (with slight variations in title) beginning with the 1989 issue containing employment and wage data for 1988. China's labor statistics distinguish between "gainfully employed" (*congye renyuan*), a broad category that includes self-employed farmers, and a more restrictive category of "formal employees" (*zhigong*). The yearbook provides information on personnel classified as *zhigong*, a term that indicates long-term attachment (not temporary work) with (until recently) connotations of tenure. These data pertain primarily to urban workers. Although personnel like teachers, construction workers, and miners who work in rural areas will be included if they are associated with state agencies or state-owned enterprises, coverage of "collective" employment is limited to enterprises located in cities and towns (*chengzhen jiti*). This means that village-level activities are almost entirely excluded from the yearbook data.

With these qualifications, we can summarize by saying that the yearbook figures are designed to cover most personnel who are regular workers in formal jobs. Table A shows that the number of personnel included in this category is large. The data used in this study cover a population of nearly 150 million workers, with women constituting slightly less than 40 percent of the total. There is no sampling. The yearbooks contain wage information for the entire universe of *zhigong*.

[Insert Table A about here.]

Ideally, a study of wage determination should build on information about individual wages and individual characteristics such as age, sex, education, and work experience that might affect individual earnings. Although our data covers far more individuals than the survey data that underpin previous studies, we have no information on the earnings or socio-economic characteristics of individual workers. Nonetheless, the large amount of data available from the

yearbooks permits the estimation of gender wage gaps in China's formal employment sector within tight confidence limits.

A sample page from the 1993 yearbook, reproduced in the Appendix as Table 1, illustrates the nature of our data. This page includes data for two branches of state-owned industry: manufacture of craft and art objects (labeled A in the Table) and electricity, gas, and water supply (labeled B). The table gives the total workforce, the number of female workers, and the average wage for each branch, with separate figures for the entire nation, for each province-level unit (including the province-level municipalities of Beijing, Tianjin, and Shanghai), and for 14 major cities. The right-hand columns of Table 1 show a considerable variation in the proportion of women workers in state-owned public utility firms. Four jurisdictions employ between 13,100 and 13,850 women, but total employment in these locations varies from 36,376 to 59,979. The left-hand panel of Appendix Table 1 also reveals substantial geographic variation in the employee sex ratio. As noted above, it is these variations that permit us to estimate the magnitude of male-female wage differentials even though the source contains no specific information about men's and women's earnings.

The organization of the 1993 yearbook is typical. This volume includes 130 tables for the state sector, 25 tables for urban collectives, and 21 tables for enterprises classified in the residual category of "other" ownership (which includes domestic private enterprises, share-holding corporations, Sino-foreign joint ventures, and wholly-owned foreign firms). These tables cover mining, many sub-sectors of manufacturing, utilities, construction, transport and communication, wholesale and retail trade, tourism, health, education, finance, insurance, foreign trade, and government administration.

Even though China is a low-income nation with a poorly developed information industry, its economic statistics are both comprehensive and generally reliable. Inevitably, however, particular categories of statistics may be subject to large error margins (Rawski and Mead 1997). The data used for this study come from Chinese labor yearbooks. The yearbooks are compiled

from the regular reports that Chinese enterprises submit to local offices of China's State Statistics Bureau (*guojia tongjiju*). We regard data on employment and money wages as particularly reliable. These figures are easy to comprehend. Chinese firms and agencies have collected and reported information about employment and wages for decades. Labor and wage data involve no sophisticated concepts and require no elaborate calculation. There is some possibility for confusion among categories of employees. We cannot be certain that the treatment of temporary contract personnel, employees who have requested temporary unpaid leave (*lixiu*), or workers undergoing involuntary furlough (*xiagang*) is uniform throughout the statistical system. Despite possible minor flaws, we see no major weaknesses in the employment and wage data underlying our analysis. We believe that our data provide comprehensive and accurate information on the number of workers, the gender composition of the work force, and money wage payments for the industrial branches, regions, and enterprise types included in the annual labor yearbooks.

The wage and employment data used in the following analysis are summarized in Tables B and C, both by form of ownership and year. Not only has the nominal wage level under all three forms of ownership risen dramatically over the period but the degree of variability as well. Looking at China's state sector, we find that wages have risen from 1853 to 4786 yuan per year. The coefficient of variation on wages has risen from 22.85 to 36.33 (Table B). The employment share of female workers in the middle 50 percent of observations varies between 26 and 42 percent (Table C). In the collective sector wages have also risen rapidly but remain below those in the state sector. The proportion of women in the collective-sector labor force has fallen quite sharply from 48 percent in 1988 to 38 percent in 1994. In the other-ownership sector wages exceed those in the state sector and have risen from 2153 to 6072 yuan per year.

[Insert Table B about here.]

[Insert Table C about here.]

3. STATISTICAL METHOD

We follow Svejnar (1984), employing a model which uses information on the share of female workers and the distribution of wages by groups¹ of employees to obtain estimates of the male-female wage gap in China's formal employment sector. We then investigate how much of the total gap can be attributed to factors such as location, branch of industry, and type of ownership.

In principle, we could combine all the data contained in the yearbooks covering 1988-1994 into a single equation with 20,570 observations to estimate the ratio of female wages to male wages while controlling for year, industrial branch, region, and ownership form. In reality, changes in the classification of industries and the organization of the yearbooks make it impossible to employ such a comprehensive panel of data. In any event, there is no reason to expect that the wage gap is constant. We therefore carry out a series of calculations to investigate the size and trend of gender wage gaps over time, across space, and among different types of enterprises.

The average wage \bar{W} , for a given group can be thought of as a weighted average of the mean male and female wages in the group:

$$(1) \quad \bar{W} = (F)\bar{W}_f + (1-F)\bar{W}_m$$

Where F is defined as the proportion of females in the group, \bar{W}_f is defined as the (unobserved) average female wage rate for the group, and \bar{W}_m is the (unobserved) average male wage rate for the group. Equation (1) can be rewritten as:

$$(2) \quad \bar{W} = \bar{W}_m + F(\bar{W}_f - \bar{W}_m)$$

¹ A group consists of a given branch of industry, under a given form of ownership, in a given region, in a given year.

If we define \bar{W}_0 as a true, but unobservable, average productivity wage, a wage which is free of labor market discrimination, we can represent the difference (δ_m) of male and productivity wages and the difference (δ_f) of male and female wages respectively as:

$$(3) \quad \delta_m = \bar{W}_m - \bar{W}_0$$

$$(4) \quad \delta_f = \bar{W}_f - \bar{W}_m$$

Substituting (3) and (4) into (2) yields:

$$(5) \quad \bar{W} = \bar{W}_0 + \delta_m + F*\delta_f$$

Since \bar{W}_0 is unobservable it is replaced in (5) with a function of its determinants:

$$(6) \quad \bar{W}_0 = \beta_0 + X'\beta + \epsilon \quad \text{yielding:}$$

$$(7) \quad \bar{W} = \beta_{0d} + F*\delta_f + X'\beta + \epsilon$$

$$\text{Where } \beta_{0d} = \beta_0 + \delta_m$$

The wage differentials in the above specification are measured in levels and in terms of currency units. It is clearly both preferable and more convenient to express the wage gap in relative terms so we replace (7) with its corresponding logarithmic form²:

$$(8) \quad \text{Ln } \bar{W} = \beta_{0d} + F*d_f + X'\beta + \epsilon$$

$$\text{Where: } \beta_{0d} = \beta_0 + d_m$$

² We derive (8) as an approximately true relationship using steps analogous to (1) - (7) and the calculus result that for small differences in any two variables X and Y, $(X-Y)/Y \approx \text{Ln } X - \text{Ln } Y$.

$$\text{and } d_m = \text{Ln } \bar{W}_m - \text{Ln } \bar{W}_0$$

$$d_f = \text{Ln } \bar{W}_f - \text{Ln } \bar{W}_m$$

We estimate (8) for each of the years 1988 through 1994. We use the natural log of the average annual wage for each group as the dependent variable. Since each group differs in terms of the number of workers that it represents we use the weighted least squares method of estimation, with the square root of the size of the labor force in each group as the weight. In principle, the X vector should contain all the exogenous variables which explain the reduced-form equation of $\text{Ln } \bar{W}_0$. We proxy the explanators of $\text{Ln } \bar{W}_0$ with dummy-variable representations of the industrial branch (textiles, banking, etc.), location, and form of ownership (state, collective, other ownership forms). F, the proportion of female workers in a given group, completes our list of right-hand side variables.³ The coefficient d_f in (8), gives us an estimate of the log difference in male and female wages. We thus obtain female wages as a proportion of male wages by taking the anti-log of the coefficient d_f .

4. STATISTICAL RESULTS

A. Male-Female Wage Differentials by Year

Our estimates of the total wage gap suggest an enormous degree of inequality in male and female wages. Table D, Column 2 reveals that women's wages as a proportion of men's wages decline from a high of 0.553 in 1988 to a low of 0.418 in 1994.⁴ Women in China may, as the

³ As explained below, we plan further work that will add education to the X vector of characteristics that we use to analyze the observed variation in men's and women's wages.

⁴ Boldface type indicates coefficients for which the p-value is less than or equal to 0.0001. These coefficients are precise estimates. The probability that the true value of the female-male wage ratio falls close to the estimated coefficient shown in the table is extremely high.

official slogan says, "hold up half the sky," but these figures indicate that the rhetoric of equality is far from the reality for women in the formal employment sector. These estimates are derived from a regression based on Equation (8) estimated with only a constant term and F, the female proportion of the labor force, as explanatory variables. As Table D reveals, the sample sizes are large, varying between 2200 and 3600 observations per year, and the estimates are precise, with p-values less than 0.0001. The difference between the wage gap of 0.553 at the beginning of the period and 0.418 at the end is both large and statistically significant.

[Insert Table D about here.]

The total wage gaps mentioned above need to be put in perspective by comparing them to the wage gaps prevailing in other economies. The total wage gaps in China from 1988 to 1994 are uniformly larger, that is, women's wages as a proportion of men's are lower, than in any of the Asian countries reported in Table E, with the exception of Japan in 1988 and 1989. Hong Kong, Singapore, and Sri Lanka have wage gaps considerably smaller than those found in urban China, as do the European countries listed in Table E.

[Insert Table E about here.]

We expect that some of the total gender wage gap in China can be explained by differences in location, branch of industry, ownership type, and education. Analyses of these factors, with the exception of education, follow. Table D, Column 3 reports wage ratios based on regressions which control for location (province), and ownership type (state, collective, and "other") by means of dummy variables. Here we find evidence of an even more rapid deterioration of female to male wages, with a fall of twenty percentage points from 1988 to 1994. Once again the difference in the wage ratios between 1988 and 1994 is large and statistically significant.

The gender gap shrinks quite remarkably when we control for branch of industry by means of dummy variables.⁵ As Table D, Column 4 reveals, women's wages as a proportion of men's rise to 0.936 in 1991 before declining to 0.746 in 1994. The decline between the 1991 and 1994 figures is statistically significant. Despite this decline (which simply mirrors the declines in the wage ratios based on the regressions without controls and controlling for ownership and location) women seem to fare better in comparison to men within an industry than across industries. It seems that much of the disparity in wages is due to women being crowded into low-paying industries. Figure 1 confirms this observation, showing a consistent pattern across economic sectors in which average wages decline as the share of female workers rises, with the gap between average wages in sectors with the lowest and highest proportion of women expanding substantially during the period of our study.

[Insert Figure 1 about here.]

B. Gender-Wage Differentials by Ownership Types

Chinese statisticians classify economic activity according to ownership. In addition to the state sector, which includes entities "owned by all the people" (*quanmin suoyouzhi*) for which ultimate control rests with agencies of the national government, there are large numbers of entities classified under "collective" (*jiti suoyouzhi*) or other ownership types.

Collectives are public-sector entities that are owned by local communities or local governments. China's dynamic township-village industries (TVEs) are typically organized under collective ownership. Our data source provides information on "urban collectives" (*chengzhen jiti*), a category that includes activities based in cities (*cheng*) and towns (*zhen*), but not in townships (*xiang*) or villages (*cun*). Our study therefore includes only a small portion of the TVE

⁵ The yearbooks aggregate the data in ways which vary from year to year so the number of industries also varies from year to year, ranging from a low of 85 to a high of 130 industries.

sector (*xiangzhen qiye*), which consists of enterprises linked to the town, township, and village level.

Entities that are neither state nor collective are lumped into a residual category of "other" ownership (*qita suoyouzhi*), a diverse category that includes domestic private enterprise, domestic share-holding corporations, joint ventures involving offshore investors, and wholly foreign-owned firms.

Table C gives an overview of labor force in the state, urban collective, and "other" ownership categories. Total employment and female employment increased slightly over the period of our analysis while the proportion of women in the work force remained virtually constant. In the collective sector total and female employment decreased slightly over the period while the female proportion of the labor force fell considerably from 48 to 38 percent. Employment in the "other ownership" category has grown swiftly, spurred forward by fast growth among joint ventures and domestic private firms, and by the conversion of state enterprises to share-holding corporations.

Wage data, summarized in Table B, indicate a consistent rank order of wages, with the highest earnings found in the "other" category and with state-sector wages (as well as fringe benefits, which do not appear in these data) substantially above collective pay scales. Nominal wages have risen rapidly in each ownership group, with the fastest increase coming in the state and "other" sectors.

Results of separate annual regressions for data from the state, urban collective, and "other" ownership sectors, respectively, constitute the three panels of Table F. Columns 3, 4, and 5, in each of the panels, indicate the estimated ratio of female to male wages based on our estimate of the total wage gap, the wage gap after controlling for location, and the wage gap after controlling for location and industry, respectively. The 1993 coefficients for the state sector, for example, indicate that, on average, female workers in the state sector earn 54.1 percent of the

wages paid to male workers. After controlling for location, our estimates indicate that women earn 43.7 percent of the wages paid to their male counterparts in the same province. Once industry and location are controlled for, women's wages rise to 71.7 percent of men's.

[Insert Table F about here.]

The boldface coefficients in Table F point to two substantive conclusions. Contrary to our expectation of greater wage equity in the state sector, we find no evidence that gender wage differentials are larger in the (urban) collective sector than in the state sector. On the contrary, our results indicate greater pay equity among men and women in the collective sector both with and without controlling for location. If we add controls for industry, the results, although lacking precision, confirm the impression of greater gender pay equity in the collective sector. Our results consistently portray the "other" ownership sector (foreign-linked firms, private enterprises, etc.) as recording the largest gender wage gap.

Our results are quite different from those of Qian (1996, p. 76), who finds the largest gender wage gap in the collective sector at (14 percent), followed by the state sector (7 percent), and smallest for the joint-foreign sector (1 percent). Note, however, that Qian's results are based on a sample of approximately 2,500 individuals residing in the more developed areas of Guangdong Province (N=1774) and Beijing (N=707).

Second, the data provide a clear indication of increasing gender wage inequality in both the state and collective sectors (with no clear trend in the other-owned sector). In the state sector, the ratio of female to male wages based on the total wage gap and the gap controlling for location, declines in each year, as do the (statistically significant) results based on regressions with controls for location and industry. In the state sector, both the unadjusted wage ratio and the ratio adjusted for location decline by approximately twenty percentage points between 1988 and 1994; adding controls for industry suggests an equally large decline in the final years covered by our data. In the collective sector, the unadjusted wage ratio declines more steeply, but adding

controls for location produces a decline in the gender wage ratio which, although substantial (approximately 13 percentage points between 1988/90 and 1993/94), is somewhat smaller than the comparable decline in the state sector.

Surprisingly, in the collective sector with industry and location controls, for the three years where our results are statistically significant, women appear to earn twenty to thirty-eight percent more than men. There is no decline in women's wages as a share of men's but rather an increase in women's premiums over these three years. This observation, which contrasts sharply with the general picture of low female earnings, invites further study. Though the aggregate nature of our data preclude further testing, we may speculate that women might be able to earn more than men in industries where wages consist largely of piece-rate payment.

Table F's panel on the state sector reveals that the wage gap widens once location is controlled for, a result which stands in contrast to the narrowing of the gap with location controls for the whole sample (Table D) and for the years 1990-1994 in the collective sector. This widening of the gap with location controls implies that state-sector wages are higher in the provinces with relatively high proportions of female workers in the state sector.

C. State-Sector Wage Differentials by Industry Groups

Table G reports the gender wage ratios by year (1988-1992) for three broadly-defined industry groups⁶ within the state-owned sector: agriculture, industry, and real estate management, public utilities, residential service and consulting (hereafter referred to as real estate management). Agriculture here does not include family farming; it refers to workers in state-run endeavors such as state farms and agricultural extension services. The sample sizes, determined by the number of tables in each of these broadly defined groups, vary dramatically: agriculture has less than 200

⁶ The Wage and Labor Statistical Yearbooks for 1989-1993 divide the state sector data into twelve broadly-defined industry groups. Several of these groupings are too small to run the underlying regressions; others yielded statistically insignificant results.

observations in each year, industry has between 850 and 1000 observations, and real estate management has about 240. Nevertheless, estimates from these relatively small regressions appear to be quite precise. In most cases the underlying coefficient of interest (that on the proportion of female workers) has p-values less than 0.0001. The total gender wage gap in agriculture and real estate management exceeds the total wage gap for the entire state sector (Table F, top panel) whereas the gender gap in industry is somewhat smaller than in the state sector. In each of these three broad industry groupings the trend of rising wage inequality is consistent with the findings for the state and collective sectors discussed above, regardless of whether we consider the ratios based on the total wage gap or on the regressions which control for location.

[Insert Table G about here.]

Both the content and the organization of the statistical material included in the annual labor yearbooks change from year to year. As mentioned above, the number of industries varies from 85 to 130 for the years included in our sample. There is, however, a subset of 34 industrial branches in the state-owned sector whose definitions remain constant throughout the time frame of our sample. When we employ this subset to investigate wage gaps we find, to our surprise, no evidence of a decline in the ratio of female to male wages.

Table H contains the wage ratios estimated for this sub-sample of 34 industrial branches. The total wage gap is very large and quite consistent, with the ratios only varying between 44 and 46 percent in the years between 1988 and 1992 though falling to 41.4 percent in 1993 and increasing to 54.6 percent in 1994. The wage gap, adjusted for province and industry, is much smaller, varying from a low of 77 percent in 1993 to a high of 86.4 percent in 1988. Once again the difference in the wage gap within versus across industries is very striking. Women are being crowded into low-paying industries.

[Insert Table H about here.]

D. Spatial Patterns of Male-female Wage Distinctions

China's economy is large and diverse. There is a distinct pattern of declining prosperity as one moves from the relatively developed, industrial coastal region through the central region and into the less developed, more agriculturally-oriented western region. The respective 1990 shares of China's coastal, central, and western provinces in industrial output value, for example, amounted to 62.2, 25.9, and 11.9 percent [Hsueh and Woo 1991, p. 59].

Table I presents estimated annual ratios of female to male wages for China's East, Central, and Western regions. The total wage gap is smaller in the eastern, coastal provinces than in the western provinces, which in turn have a smaller total gap than the central provinces. The unadjusted ratios of female to male wages for China's central region are extraordinarily low, falling to roughly one-quarter during 1992-94. Adjusting for ownership and industry eliminates this unusual degree of inequity, suggesting again a pattern in which a large proportion of women find employment in low-wage industries. Looking at the total wage gap we find that women's wages as a proportion of men's decline consistently in all three regions. We see that the adjusted wage ratios increase somewhat in all three regions until 1991 when they begin to drop sharply for the remaining three years.

[Insert Table I about here.]

We extend our study of regional wage patterns by comparing data for China's three province-level metropolitan areas (Beijing, Tianjin, Shanghai) with figures for 14 other large cities. Results appear in Table J. Surprisingly, we find that gender inequality is somewhat greater in the three metropolises than in the 14 large cities. However, when we compare the wage ratios, based on both the total and adjusted wage gaps, in Tables D and J, there is clearly greater gender equality in the three metropolitan areas than in the entire urban sector. A comparison of wage

ratios, based on the regressions for the 14 large cities yields a similar conclusion, that is, the cities exhibit more gender equality than the urban sector as a whole.⁷

[Insert Table J about here.]

These data show that the phenomenon of rising gender gaps has not affected China's three large metropolises. There is, however, some evidence of a rising gender gap for the 14 large cities.

5. INTERPRETATION AND CONCLUSION

This paper applies econometric methods to a large body of data relating to average wages and the number and share of female employees to investigate disparities between men's and women's wages in China's urban, formal labor markets during the period 1988-1994. Our preliminary analysis points to several important conclusions.

We find consistent evidence of substantial and persistent gaps between men's and women's wages in formal, mainly urban employment in the People's Republic of China during the period 1988-1994. When we simply estimate the ratio of female to male wages for each year (Table D, Column 3), we find that the ratio of female to male wages varies from 0.553 to 0.418, indicating that money wages received by the average female worker amount to between 42 and 55 percent of the comparable figures for male employees. These observations, which are not adjusted for variations in age, education, or work experience, resemble figures for other East Asian economies -- Japan and South Korea.

Results from these raw data can be deceptive, because some or all of the wage difference may be attributable to uneven distribution of male and female workers across space, branch of

⁷ Due to data limitations, the figures in Table J control only for ownership and city and not for industrial branch.

industry, and ownership type. Table D, Column 4 presents the results of separate annual regressions, each of which takes separate account of the influence of province and ownership type on average wages. Here the wage ratios vary between 46 and 66 percent. The results in Table D, Column 5 based on regressions which control not only for location and ownership but also for industry present a much brighter picture with women's wages varying from 75 to 94 percent of men's wages. The wage gaps are much larger across industries than within industries in China's formal labor markets.

Our regression technique gives equal weight to observations made up of widely differing numbers of workers. Provincial data for rubber manufacturing in 1992, for example, range from 479 workers in Qinghai Province to 41,051 employees in Shandong (Labor 1993, p. 238). Each of these labor figures, together with the associated information on average wages and numbers of female employees, enters our calculations as a single observation. Although a more complex calculation procedure that assigned employment-based weights to each observation might alter the level of the estimated gender wage gap, the overall stability in China's industrial structure makes it highly unlikely that such a procedure would change our observed trends.

One important variable missing from these equations is education. Higher educational attainment is associated with higher wages in China (Maurer-Fazio, 1994). If the educational achievements of men systematically exceed those of women employed in the same industries, the addition of education variables to these equations, a modification that we intend to pursue, may explain some of the residual gender wage gap. Although education levels are not included in the labor yearbooks, published information from China's 1990 population census tabulates the educational attainment of male and female employees in different sectors of the economy (Population 1993, Table 6-13). Even though these data pertain to a single year and provide no regional breakdowns, we anticipate little variation across space or within the period covered by this study in the relative educational attainment of male and female workers within specific economic sectors and across different sectors (e.g. finance and textiles). We intend to explore

whether the education variables derived from this limited information will help explain some of the male-female wage differentials in China's formal employment sector.

Years of work experience is a standard explanatory variable in econometric studies of wage determination. Although we have no data source that would support the creation of a variable related to experience that we could add to our list of independent variables, we can speculate on the possible impact of experience on gender wage gaps. We know that the participation rate of Chinese urban women is extraordinarily high, and the phenomenon of near-universal labor-force participation dates back to the 1960s (Rawski, 1979). In China, unlike Japan, women do not leave their jobs following marriage or childbirth. The biggest difference between the work experience of men and women arises from differential retirement policies. Under Chinese socialism, the retirement age for women was consistently lower than for men. Economic reform has preserved this difference. Furthermore, there is considerable anecdotal information suggesting that, during the 1990s, managers eager to reduce the cost of widespread labor redundancy have pressured large numbers of female employees to take early retirement. With the exception of older workers, we therefore expect to find little variation in work experience among men and women in the same age cohorts. For older age cohorts and for the entire work force, however, early retirement for women should raise the average experience of male workers above the comparable figure for female workers. Under these circumstances, we expect that adding years of work experience and its square would reduce the unexplained component of gender wage differences, perhaps by a considerable margin.

Despite the omission of education (and work experience) from these initial results, it seems reasonable to conclude that our data are not consistent with the most optimistic statements about gender equality, as when Tang and Parish (1995, IX-1) see China as approaching circumstances in which "women gain near equality with men in education, work, and income." On the contrary, our results, although preliminary and incomplete, suggest that statistical analysis involving market-based explanatory variables is unlikely to eliminate gender-based wage differences. Even when education is added to our regression equations, we expect that the results

for China, as for other East Asian nations, will show substantial gender-based wage differentials that may be best explained by sex-based discrimination favoring male workers.

Our analysis of the trend of wage inequality reinforces these observations. We find no evidence of a tendency for the gap between male and female wages to decline. On the contrary, calculations based on the whole data set, on data for the state and collective sectors, for broad industry groupings, for regions (coastal, central, interior), and for the large cities strongly indicate that the ratio of women's to men's wages declined during the period of analysis. Calculations based on data for China's three province-level municipalities, and on the balanced sub-sample of 34 state-sector industries while not offering more evidence in support of this trend, certainly do not display any movement in the direction of reducing gender wage differences.

We began this study with clear expectations about the pattern of wage inequality across space and across ownership types. Chinese attitudes toward treatment of men and women in the workplace reflect two divergent perspectives. In China, as elsewhere in East Asia, there is a strong historical tradition of male dominance and female subordination. This aspect of Chinese popular culture is visible in the wage policy of China's People's Communes, which typically assigned more work points to the weakest males than to the strongest female workers (Chan et al, pp. 92-93). At the same time, China's government has vigorously propagated an ideology of gender equality built on the slogan "Women hold up half of heaven" (*funü nengding banbiantian*).

This clash of ideals encouraged us to hypothesize that gender wage gaps might follow a gradient based on a hierarchy of central places, with the smallest differences between male and female wages occurring where state influence is greatest. Thus we anticipated that the gender gap would be smaller in the largest cities than in smaller cities, smaller in state enterprises than in collectives, and smaller in coastal areas than in China's far-flung interior provinces.

Other sources provide some empirical support for these expectations. Data for 121,421 enterprise and government officials, a population with high seniority (53 percent have at least 20

years' work experience) and high educational qualifications (39.5 percent have post-secondary educational credentials) show respective ratios of female to male wages of 97.0 percent and 86.6 percent for government and enterprise personnel, confirming our expectation of finding greater wage equality within government than outside it (Yearbook 1996, p. 129). Our prediction of a rise in the gender gap as we move from east to west is at least partially confirmed by our data (Table I).

Even so, the general picture emerging from our analysis does not completely conform to our initial expectations. Unlike previous studies (Qian 1996, Yang and Zax 1996), we find no evidence that gender inequality is systematically higher in collectives than in the state sector (Table F), though inequality appears to be highest in the non-collective, non-state "other-owned" sector. Although our data for China's three great metropolises (Beijing, Tianjin, Shanghai), reveal gender wage gaps that are somewhat smaller than the national average, they also reveal gender gaps that are larger than results for 14 other large cities. Clearly the pattern of wage inequality is more complex than we expected. Our results give an impression of a good deal of heterogeneity in the behavior of gender wage gaps.

Blau and Kahn (1996) find that the large size of gender wage gaps in the United States, relative to other market economies, is partly attributable to the relatively high degree of wage inequality in the United States. If we accept the implication that wage variation may be an important contributor to gender wage inequality, then the progress of Chinese reform, which has brought a considerable expansion of (previously small) wage differentials (Sensenbrenner, pp. 49-91), may explain part or all of the expanding gender wage gaps that we have discovered. We do find substantial increases in the coefficient of variation of average wages. Looking at the state sector, for instance, we find that the coefficient of variation for average wages in 1992-1994 is 28.48, 35.29, and 36.33 (Table B). These changes confirm our expectations about the influence of China's economic reform on wage patterns.

Differences between wages paid to men and to women is a subject that has attracted widespread attention. Available information about gender wage differences in China, home of the world's largest national labor force, consists mainly of small sample surveys. Conclusions based on such data are incomplete and wildly inconsistent. Our research aims to use data covering large numbers of workers to obtain precise and reliable information about gender pay equity in China. Although the wage data used in this study provide information about groups of workers rather than individuals, the number of observations is sufficiently large to establish basic descriptive information about gender pay equity in China's urban economy. We find that women earn substantially less than men. Controlling for location, ownership, and industry reduces, but by no means eliminates, the gender wage gap. We find considerable evidence that the ratio of women's wages to men's earnings declined during 1988-1994. Sectoral and geographic patterns of wage inequality appear considerably more complex than we expected. Our findings invite further study. Clearly, there is much more to be learned about the structure of compensation within China's huge and dynamic labor market.

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Table A**Employment in China 1988-1994**

Year	Gainfully Employed (millions)	Formal Employees	
		Number (millions)	Percent Female
1988	543.3	136.1	37.0
1989	553.3	137.4	37.4
1990	567.4	140.6	37.7
1991	583.6	145.1	37.8
1992	594.3	147.9	37.8
1993	602.2	148.5	37.3
1994	614.7	148.5	38.0

Source: Labor Annual 1995, pp. 9, 26.

Table B

**Mean Annual Wage
by
Ownership Type and Year**

State Sector

Year	Mean Wage (Yuan)	10th Percentile	25th Percentile	75th Percentile	90th Percentile	Coefficient of Variation
1988	1853.33	1393.00	1582.00	2098.00	2420.50	22.85
1989	2050.22	1501.00	1712.00	2344.00	2741.00	24.76
1990	2279.14	1650.50	1892.00	2615.00	3053.50	26.32
1991	2477.72	1773.00	2021.00	2847.00	3355.00	26.38
1992	2876.76	1990.50	2321.00	3334.00	3976.50	28.48
1993	3531.81	2300.00	2805.00	4251.00	5352.00	35.29
1994	4786.33	3199.00	3999.00	6282.00	7711.00	36.33

Collective Sector

1988	1423.36	1033.00	1159.00	1600.00	1880.00	26.65
1989	1554.47	1120.00	1263.00	1751.00	2093.00	27.27
1990	1680.09	1316.00	1456.00	1965.00	2236.00	22.95
1991	1866.33	1451.00	1626.00	2212.00	2540.00	24.64
1992	2110.08	1614.50	1824.00	2594.00	3021.50	28.20
1993	2552.07	1812.00	2138.00	3274.00	4193.00	35.34
1994	3246.66	2297.00	2750.00	4638.00	5839.00	37.27

Other-Owned Sector

1988	2153.18	1287.00	1531.00	2105.00	2618.00	29.07
1989	2708.53	1388.00	1560.00	2477.00	3213.00	34.78
1990	3009.24	1401.50	1814.00	2916.00	3605.50	35.03
1991	3489.67	1529.00	1979.00	3263.50	3873.00	37.51
1992	4123.67	1838.00	2252.00	3773.00	4678.00	37.50
1993	4998.63	2234.00	2842.50	4658.00	6270.00	38.24
1994	6071.72	2921.00	3582.00	5812.00	7339.00	35.97

Source: Labor Annuals 1989-1995

Table C**Female Proportion of the Labor Force, Number of Women in the Labor Force, and Size of the Labor Force by Type of Ownership and Year****State Sector**

Year	Proportion Female	Coefficient of Variation	25th Percentile	75th Percentile	Women in Labor Force	Total Labor Force
1988	0.34	35.16	0.26	0.41	32,454,565	97,217,520
1989	0.34	34.52	0.26	0.40	33,319,020	99,813,786
1990	0.35	33.70	0.27	0.41	34,493,349	101,103,604
1991	0.35	32.96	0.27	0.42	35,819,537	104,070,273
1992	0.35	32.79	0.28	0.42	36,806,069	106,318,666
1993	0.34	32.24	0.26	0.40	36,718,400	104,816,200
1994	0.34	31.10	0.27	0.40	37,692,470	106,581,699

Collective Sector

1988	0.48	34.35	0.37	0.60	16,213,534	34,670,107
1989	0.48	33.29	0.38	0.60	16,234,074	34,457,045
1990	0.40	38.55	0.28	0.52	16,699,374	35,492,624
1991	0.40	39.14	0.27	0.51	16,907,679	36,277,695
1992	0.39	37.02	0.28	0.51	16,580,492	36,212,373
1993	0.37	37.72	0.26	0.48	14,490,300	33,459,800
1994	0.38	38.44	0.26	0.48	14,195,946	32,112,621

Other-Owned Sector

1988	0.47	25.92	0.40	0.54	316,233	661,050
1989	0.50	33.95	0.41	0.59	652,476	1,284,276
1990	0.48	29.71	0.41	0.56	829,545	1,615,308
1991	0.49	27.70	0.41	0.58	1,118,761	2,135,013
1992	0.50	28.03	0.43	0.58	1,806,745	3,437,101
1993	0.45	22.63	0.40	0.51	2,553,000	5,334,200
1994	0.45	20.88	0.41	0.51	3,583,126	7,473,358

Source: Labor Annuals 1989-1995

Table D
Time Trends in the Ratio of Female to Male Wages
based on
WLS Annual Regression Results

Year	No. of Obs.	Wage Ratio ^a (Total Gap)	Wage Ratio ^b (Controlling for Ownership)	Wage Ratio ^c (Controlling for Industry)
1988	3535	0.553	0.656	0.856
1989	3621	0.550	0.629	0.909 [‡]
1990	2865	0.489	0.593	0.921 [†]
1991	2879	0.501	0.557	0.936 [†]
1992	2948	0.468	0.498	0.855 [‡]
1993	2227	0.471	0.477	0.795 [‡]
1994	2495	0.418	0.461	0.746

Note:

The ratios of female to male wages in the above table are calculated by taking the anti-log of the coefficient d_f in each of the above regressions. The estimates of d_f underlying the **boldface** wage ratios in the above table are very precise with p-values less than 0.0001.

^a The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{od} + d_f * F + \epsilon$

^b The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{od} + d_f * F + X' \beta + \epsilon$
The Xs here include provincial and ownership dummies.

^c The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{od} + d_f * F + X' \beta + \epsilon$
The Xs here include provincial and industry dummies.

[†] In these cases, the estimates of d_f have p-values greater than 0.0001 but less than 0.001, and may still be regarded as very precise, albeit to a lesser degree than the boldface estimates.

^{*} In these cases, the estimates of d_f have p-values greater than 0.001 and less than 0.05, and are thus somewhat less precise than estimates in the [†] category.

[‡] In these cases, the estimates of d_f have p-values greater than 0.05, indicating imprecise estimates and statistical insignificance.

Table E**International Comparisons:
Female Wages as a Proportion of Male Wages**

Asia:		Europe:	
Hong Kong	0.635	Czechoslovakia	0.706
Japan	0.508	Denmark	0.833
Singapore	0.721	France	0.808
South Korea	0.567	Germany	0.742
Sri Lanka	0.749	Switzerland	0.666
		United Kingdom	0.712

Source: ILO 1995, Table 16 pp. 625-633.

Note: In this table we use the most recent data available for each nation; the years covered range from 1991 to 1994.

Table F
Time Trends in the Ratio of Female to Male Wages by Ownership Type
based on
WLS Annual Regression Results

Wage Ratios in the State Sector

Year	No. Of Obs.	Wage Ratio^a (Total Gap)	Wage Ratio^b (Controlling for Province)	Wage Ratio^c (Controlling for Province & Industry)
1988	2260	0.711	0.639	0.956 [‡]
1989	2233	0.697	0.601	0.955 [‡]
1990	2390	0.630	0.561	0.998 [‡]
1991	2382	0.609	0.530	1.010 [‡]
1992	2390	0.544	0.465	0.897 [*]
1993	1674	0.541	0.437	0.717
1994	1887	0.514	0.425	0.697

Wage Ratios in the Urban Collective Sector

Year	No. Of Obs.	Wage Ratio^a (Total Gap)	Wage Ratio^b (Controlling for Province)	Wage Ratio^c (Controlling for Province & Industry)
1988	1216	0.742	0.702	0.848 [†]
1989	1269	0.726	0.691	0.965 [‡]
1990	335	0.716 [†]	0.720	1.092 [‡]
1991	341	0.652	0.665	1.204 [*]
1992	340	0.579	0.614	1.258 [*]
1993	421	0.535	0.570	1.382 [*]
1994	465	0.480	0.569	1.113 [‡]

Table F continued on next page.

Table F (Continued)
Wage Ratios in the Other Ownership Sector

Year	No. Of Obs.	Wage Ratio ^a (Total Gap)	Wage Ratio ^b (Controlling for Province)	Wage Ratio ^c (Controlling for Province & Industry)
1988	59	0.372*	0.372*	0.534*
1989	119	1.249‡	0.490	0.409
1990	140	1.086‡	0.462†	0.346
1991	156	1.610‡	0.614*	0.419
1992	218	1.464‡	0.496	0.400
1993	132	1.120‡	0.571‡	0.572*
1994	143	1.207‡	0.231*	1.000‡

Note:

The ratios of female to male wages in the above table are calculated by taking the anti-log of the coefficient d_f in each of the above regressions. The estimates of d_f underlying the **boldface** wage ratios in the above table are very precise with p-values less than 0.0001.

^a The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{0d} + d_f * F + \epsilon$

^b The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{0d} + d_f * F + X' \beta + \epsilon$
The Xs here include provincial dummies.

^c The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{0d} + d_f * F + X' \beta + \epsilon$
The Xs here include provincial and industry dummies.

† In these cases, the estimates of d_f have p-values greater than 0.0001 but less than 0.001, and may still be regarded as very precise, albeit to a lesser degree than the boldface estimates.

* In these cases, the estimates of d_f have p-values greater than 0.001 and less than 0.05, and are thus somewhat less precise than estimates in the † category.

‡ In these cases, the estimates of d_f have p-values greater than 0.05, indicating imprecise estimates and statistical insignificance.

Table G
Time Trends in the Ratio of Female to Male Wages
for Broad Industry Groupings in the State Sector

Agriculture, Industry, and Real Estate Management, Public Utilities, Residential Service
and Consulting
Based on WLS Annual Regression Results

Wage Ratios^a Based on Total Wage Gap

Year	Wage Ratio, Agriculture	No. Of Obs.	Wage Ratio, Industry	No. Of Obs.	Wage Ratio, Management	No. Of Obs.
1988	0.521	179	0.755	884	0.618 [†]	239
1989	0.475	179	0.760	858	0.642 [*]	239
1990	0.476	179	0.599	1005	0.589 [†]	240
1991	0.474	179	0.553	1000	0.630 [*]	239
1992	0.303	179	0.511	1003	0.512 [†]	239

Wage Ratios^b Based on Regressions with Controls

Year	Wage Ratio, Agriculture	No. Of Obs.	Wage Ratio, Industry	No. Of Obs.	Wage Ratio, Management	No. Of Obs.
1988	0.396	179	0.656	884	0.704	239
1989	0.373	179	0.587	858	0.662	239
1990	0.371	179	0.507	1005	0.636	240
1991	0.386	179	0.454	1000	0.628	239
1992	0.242	179	0.401	1003	0.563	239

Notes to Table G on next page.

Note:

The Wage and Labor Statistical Yearbooks for 1989-1993 divide the state sector data into twelve broadly-defined industry groups. Several of these groups are too small to run the underlying regressions; others resulted in statistically insignificant results. We therefore report only the above three.

The ratios of female to male wages in the above table are calculated by taking the anti-log of the coefficient d_f in each of the above regressions. The estimates of d_f underlying the **boldface** wage ratios in the above table are very precise with p-values less than 0.0001.

^a The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{0d} + d_f * F + \epsilon$

^b The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{0d} + d_f * F + X' \beta + \epsilon$
The Xs here include provincial dummies.

† In these cases, the estimates of d_f have p-values greater than 0.0001 but less than 0.001, and may still be regarded as very precise, albeit to a lesser degree than the boldface estimates.

*

In these cases, the estimates of d_f have p-values greater than 0.001 and less than 0.05, and are thus somewhat less precise than estimates in the † category.

‡ In these cases, the estimates of d_f have p-values greater than 0.05, indicating imprecise estimates and statistical insignificance.

Table H
Time Trends in the Ratio of Female to Male Wages
Based on
A Balanced Sub-sample of 34 Industrial Branches Within the State Sector

Year	Wage Ratio ^a	No. Of Obs.	Wage Ratio ^b	Mean Wage	CV Wage ^c	F, Pro. Female ^d	CV Pro. Female ^e
1988	0.457	964	0.864*	1912	25.29	0.31	36.96
1989	0.441	960	0.840*	2097	27.15	0.31	35.97
1990	0.447	967	0.921 [‡]	2364	28.49	0.31	34.25
1991	0.446	966	0.960 [‡]	2546	28.87	0.32	34.67
1992	0.453	968	0.840*	3016	29.56	0.32	34.53
1993	0.414	931	0.770*	3733	36.44	0.34	33.92
1994	0.546	963	0.820*	5442	38.55	0.34	33.03

Note:

The ratios of female to male wages in the above table are calculated by taking the anti-log of the coefficient d_f in each of the above regressions. The estimates of d_f underlying the **boldface** wage ratios in the above table are very precise with p-values less than 0.0001.

- ^a The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{0d} + d_f * F + \epsilon$
- ^b The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{0d} + d_f * F + X' \beta + \epsilon$
The Xs here include provincial and industry dummies.
- ^c The coefficient of variation on wages.
- ^d The proportion of females in the labor force.
- ^e The coefficient of variation on the proportion of females in the labor force.
- [†] In these cases, the estimates of d_f have p-values greater than 0.0001 but less than 0.001, and may still be regarded as very precise, albeit to a lesser degree than the boldface estimates.
- ^{*} In these cases, the estimates of d_f have p-values greater than 0.001 and less than 0.05, and are thus somewhat less precise than estimates in the † category.
- [‡] In these cases, the estimates of d_f have p-values greater than 0.05, indicating imprecise estimates and statistical insignificance.

Table I
Time Trends in the Ratio of Female to Male Wages
by Major Region

Year	East Ratio ^a	East Ratio ^b	No. Of Obs.	Central Ratio ^a	Central Ratio ^b	No. Of Obs.	West Ratio ^a	West Ratio ^b	No. Of Obs.
1988	0.637	0.734	1421	0.417	0.646	1103	0.517	0.956 [‡]	1011
1989	0.628	0.734	1472	0.416	0.716	1123	0.494	0.940 [‡]	1026
1990	0.596	0.832 [*]	1171	0.338	0.800 [*]	870	0.466	0.656	824
1991	0.612	0.827 [*]	1177	0.333	0.831 [*]	881	0.469	0.713	821
1992	0.594	0.746	1206	0.284	0.883 [‡]	901	0.413	0.548	841
1993	0.549	0.661	958	0.283	0.693	712	0.491	1.017 [‡]	557
1994	0.495	0.571	1017	0.235	0.649	758	0.427	0.563	720

Note:

The ratios of female to male wages in the above table are calculated by taking the anti-log of the coefficient d_f in each of the above regressions. The estimates of d_f underlying the **boldface** wage ratios in the above table are very precise with p-values less than 0.0001.

^a Based on the total wage gap. The underlying annual regression equation is:
 $\text{Ln } \bar{W} = \beta_{0d} + d_f * F + \epsilon$

^b Based on the wage gap after controlling for branch of industry and ownership type. The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{0d} + d_f * F + X' \beta + \epsilon$
 The Xs here include industry and ownership dummies.

[†] In these cases, the estimates of d_f have p-values greater than 0.0001 but less than 0.001, and may still be regarded as very precise, albeit to a lesser degree than the boldface estimates.

^{*} In these cases, the estimates of d_f have p-values greater than 0.001 and less than 0.05, and are thus somewhat less precise than estimates in the [†] category.

[‡] In these cases, the estimates of d_f have p-values greater than 0.05, indicating imprecise estimates and statistical insignificance.

Notes continued on next page.

Our provincial grouping follows standard Chinese statistical practice (Investment 1991, p.334):

Coastal region: Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Guangxi, Hainan.

Central region: Shanxi, Neimenggu, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, Hunan.

Western region: Sichuan, Guizhou, Yunnan, Xizang (Tibet), Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang. (Note that Yunnan is excluded from some calculations because of insufficient data.)

Table J
Time Trends in the Ratio of Female to Male Wages for Major Cities

Year	3 Metro- polis Ratio ^a	3 Metro- polis Ratio ^b	No. Of Obs.	14 City Ratio ^a	14 City Ratio ^b	No. Of Obs.
1988	0.558	0.653	343	0.949 [‡]	0.782	689
1989	0.564	0.642	353	0.919 [‡]	0.787	773
1990	0.603	0.702	286	0.786 [*]	0.691	865
1991	0.598	0.661	291	0.822 [*]	0.695	955
1992	0.603	0.667	295	0.745	0.624	992
1993	0.630	0.676	237	N.A.	N.A.	N.A.
1994	0.499	0.665 [*]	252	N.A.	N.A.	N.A.

Note:

The ratios of female to male wages in the above table are calculated by taking the anti-log of the coefficient d_f in each of the above regressions. The estimates of d_f underlying the **boldface** wage ratios in the above table are very precise with p-values less than 0.0001.

^a Based on the total wage gap. The underlying annual regression equation is:

$$\text{Ln } \bar{W} = \beta_{0d} + d_f * F + \epsilon$$

^b Based on the wage gap after controlling for ownership type and location. The underlying annual regression equation is: $\text{Ln } \bar{W} = \beta_{0d} + d_f * F + X' \beta + \epsilon$
 The Xs here include ownership and city dummies; the number of observations is too low to control for branch of industry.

[‡] In these cases, the estimates of d_f have p-values greater than 0.0001 but less than 0.001, and may still be regarded as very precise, albeit to a lesser degree than the boldface estimates.

^{*} In these cases, the estimates of d_f have p-values greater than 0.001 and less than 0.05, and are thus somewhat less precise than estimates in the [‡] category.

[‡] In these cases, the estimates of d_f have p-values greater than 0.05, indicating imprecise estimates and statistical insignificance.

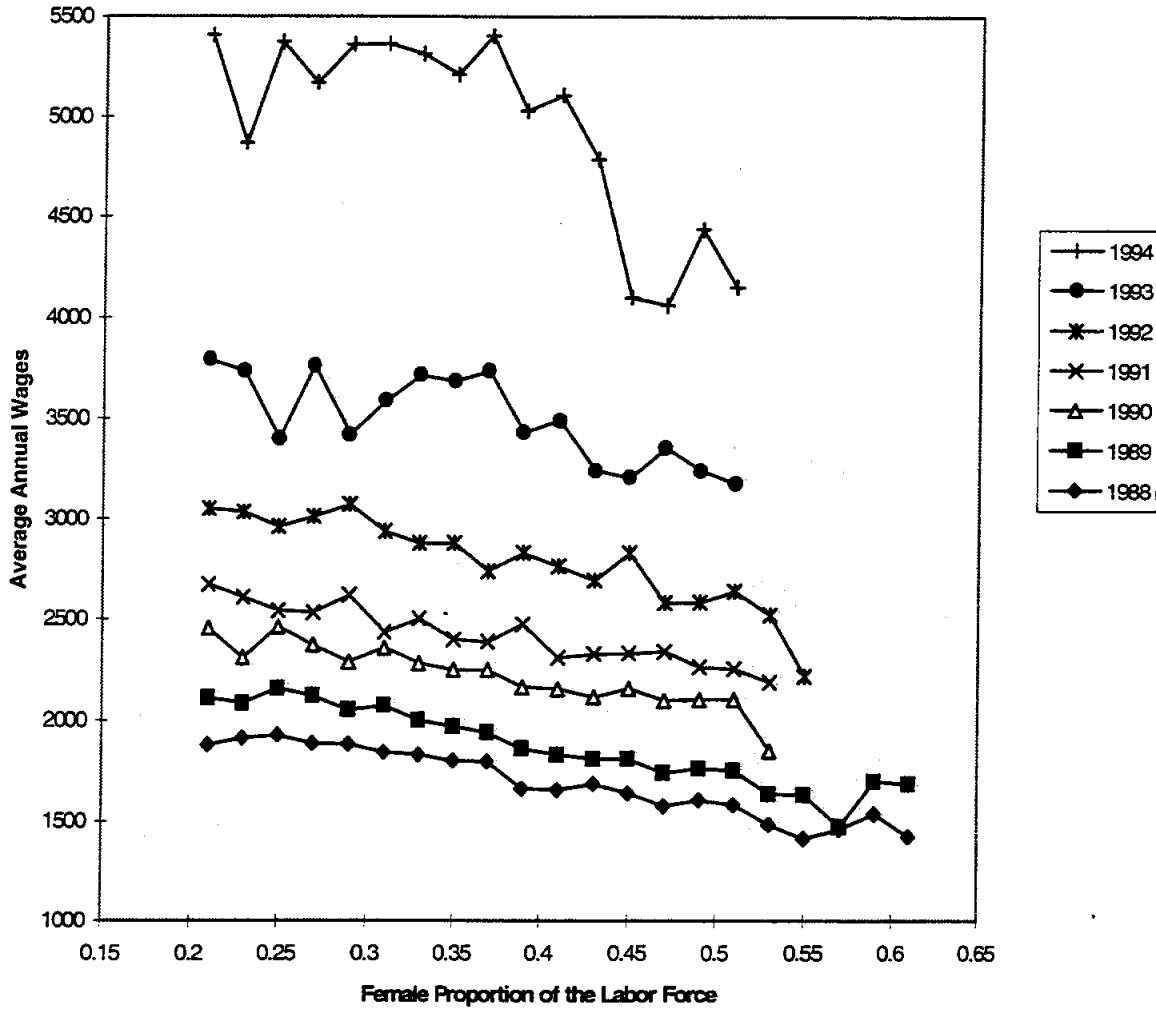
Notes continue on the next page.

We calculate separate regressions for data from the three province-level metropolises (Beijing, Tianjin, and Shanghai) and for 14 large cities for which data are separately tabulated in our sources: Shenyang, Dalian, Changchun, Harbin, Nanjing, Ningbo, Xiamen (Amoy), Qingdao, Wuhan, Guangzhou (Canton), Shenzhen, Chengdu, Chongqing, and Xi'an.

N.A. - Not available. Data for the 14 cities do not appear separately in the yearbooks containing information for 1993 and 1994.

Figure 1

Average Annual Wages By Female Proportion of the Labor Force



The average annual wages plotted above are calculated as the mean of the per capita wages for all observations per interval (defined as a range of 0.02 of the female proportion of the labor force). Only the middle eighty percent of all observations by female proportion of the labor force are used in these calculations. The resulting average annual wages are not weighted by the size of the labor force in each observation.

Appendix

Table 1
Example of Typical Labor Yearbook Data

STATE-SECTOR UNITS
1992 DATA

3-34 续表 6 (全民所有制单位, 1992年)

地 区	工艺美术用品制造业 A				电力、蒸气、热水生产和供应业 B					
	单位数 (个) A1	年末人数 (人) A2	A4 → 平均 工资 (元)		单位数 (个) B1	年末人数 (人) B2	平均 工资 (元) B4			
			#女性 A3	#女性 B3						
NATIONAL DATA → 全国总计	516	97 951	56 534	2 630	5 567	1 728 490	478 652	3 494		
PROVINCES	北京	57	7 062	3 722	3 107	26	26 217	9 362	4 267	
	天津	4	1 628	729	3 041	35	24 401	6 377	3 713	
	河北	57	12 267	6 979	1 926	236	95 621	24 337	3 331	
	山西	3	133	100	1 010	222	67 603	18 350	3 079	
	内蒙古	15	4 966	3 470	1 757	181	60 440	18 543	3 279	
	辽宁	6	999	586	1 745	173	101 393	23 158	3 687	
	吉林	5	968	616	2 020	128	53 793	11 790	3 276	
	黑龙江	12	1 853	1 113	1 249	247	94 894	25 208	3 143	
	上海	23	6 767	3 620	4 203	34	36 404	8 089	5 865	
	江苏	11	2 226	1 432	2 399	140	84 809	18 305	4 391	
	浙江	17	4 512	2 236	2 728	192	59 979	13 556	3 965	
	安徽	5	525	257	1 467	126	50 933	13 109	3 259	
	福建	12	1 855	959	1 774	182	39 883	11 343	3 626	
	江西	9	1 501	910	1 351	213	54 105	15 506	2 855	
	山东	40	8 720	5 592	1 777	210	105 303	25 431	3 412	
	河南	17	4 050	2 712	1 280	214	120 543	32 717	2 873	
	湖北	21	3 499	1 911	1 706	347	87 813	26 915	3 570	
	湖南	11	975	504	1 460	362	66 292	19 922	3 310	
	广东	89	14 687	8 981	4 018	419	86 348	26 323	3 738	
	广西	6	959	504	2 167	321	45 964	13 017	3 714	
	海南	5	173	50	2 076	79	11 293	4 110	3 823	
	四川	15	1 893	874	2 359	408	127 490	40 605	3 058	
	贵州	8	2 030	783	2 180	181	33 514	10 454	3 292	
	云南	1	30	20	1 692	281	44 264	14 599	3 249	
	西藏	14	2 988	1 253	3 522	51	4 629	1 475	4 021	
	陕西	19	2 613	1 579	1 413	158	46 071	13 844	3 563	
	甘肃	13	4 862	3 211	1 819	119	36 376	11 717	3 676	
	宁夏	3	833	655	1 695	65	10 110	3 007	4 629	
	青海	7	795	442	1 439	20	12 257	3 782	4 057	
	新疆	11	1 582	734	2 416	197	39 748	13 701	3 378	
	MAJOR CITIES	沈阳	1	130	86	4 062	12	6 693	1 702	4 598
		大连	2	901	581	2 038	11	3 474	619	3 635
		长春	2	901	581	2 038	4	2 321	383	2 521
哈尔滨		1	45	31	1 791	14	4 366	1 038	2 973	
南京		1	101	41	2 653	3	1 261	408	4 469	
北京		3	896	559	2 990	10	2 318	402	4 295	
武汉		5	2 211	554	5 235	1	17	5	4 412	
青岛		4	897	524	2 235	12	4 033	808	2 908	
烟台		1	491	252	2 426	2	319	82	2 177	
杭州		9	2 202	1 427	3 782	10	2 354	647	6 802	
深圳		29	1 124	696	4 759	1	157	33	8 038	
成都		3	653	441	4 693	32	5 478	1 509	2 460	
重庆		1	143	69	3 757	29	6 280	1 905	2 752	
西安		3	178	114	2 296	2	669	254	1 852	

Source: Yearbook of Labor Statistics of China 1993. p. 235

Key: A = Manufacture of Craft and Art Objects
B = Electricity, Gas, and Water Supply
Col. 1: Number of Units
2: Year-end Number of Workers
3: of which: Number of Female Workers
4: Average Annual Wage (Yuan)

GLOSSARY

cheng 城

chengzhen jiti 城镇集体

congye renyuan 从业人员

cun 村

funü nengding banbiantian 妇女能顶半边天

guojia tongjiju 国家统计局

jiti suoyouzhi 集体所有制

lixiu 离休

qita suoyouzhi 其他所有制

xiagang 下岗

xiang 乡

xiangzhen qiye 乡镇企业

zhen 镇

zhigong 职工

