Gender Wage Gaps by Industry in Taiwan: Evidence from 1978-2003 Manpower Utilization Survey

Hwei-Lin Chuang* and Eric S. Lin‡
Department of Economics
National Tsing Hua University

This Version: March 9, 2007

Preliminary draft – please do not quote or cite

Abstract

This paper aims to examine the interindustry wage differentials for male and female workers over time, and apply the recently developed approach of interindustry gender wage gap measures to calculate the estimated gender wage gap by industry and the corresponding standard errors based on the 1978-2003 Manpower Utilization Survey data. Our estimation results indicate that either the construction or the mining industry takes the position of the highest wage differential for both male and female workers. A female worker in the highest wage differential industry earned 15% to 36% higher wages than the average female worker among all industries and a male worker in the highest wage differential industry earned 10% to 29% higher wages than the average male worker among all industries. As to the findings of interindustry gender wage gaps, it is found that the interindustry wage differential for women in the finance, insurance & real estate industry is 11-15% below that for men and in the agriculture, forestry & fisheries industry, women have a wage differential 28-36% below that for men for the year of 2003. In addition, female workers in either the mining industry or the agriculture, forestry & fisheries industry face the largest gender wage gap compared to those in other industries for most years during our sample period.

JEL Classification: C12, J31, J71
Key Words: Interindustry wage differentials, Gender wage gap, Identification

*Professor, Department of Economics, National Tsing Hua University, Hsin-chu, Taiwan 30013. Phone: +886-3-574-2892, Fax: +886-3-572-2476, Email: hlchuang@mx.nthu.edu.tw.

†Assistant Professor, Department of Economics, National Tsing Hua University, Hsin-chu, Taiwan 30013. Phone: +886-3-574-2729, Fax: +886-3-572-2476, Email: slin@mx.nthu.edu.tw.

‡Comments are very welcome. Jiu-Yuan Chen and Ya-Yun Chang provided excellent research assistance.

1 Introduction

A persistent gender wage gap during the time period from 1978 to 1992, with women continuing to earn 65% of what men earned, has been found by Zvegligh, Rodgers and Rodgers III (1997). However, as shown in Figure 1, from 1992 on this ratio has shown an increasing trend and reached the level of 75% in 2003. Since Taiwan's industry and export mixes have shifted toward higher-skill, technology-intensive products, and lower-skill, labor-intensive industries have moved abroad, largely to Mainland China, we expect to observe changes in the interindustry wage differentials for both male and female workers. These changes are very likely to lead to the variation in the pattern of gender wage gaps by industry. As shown in Figure 2, in addition to the transition of the pattern of female-male wage ratio, we have also observed apparent variation of gender wage gaps across industries. For instance, the female-male wage ratio in the agriculture, forestry & fisheries industry (hereafter, Agriculture industry) is consistently lower than the overall female-male wage ratio while this ratio for the construction industry is always higher than the overall ratio. Moreover, the variation of the female-male wage ratio in the mining industry over time is more volatile compared to that in the other industries. Indeed, Zvegligh, Rodgers and Rodgers III (1997) found that "measured productivity differences between men and women explain a decreasing share of the aggregate log-earnings gap. Education and experience account for most of the explained gap before 1989, while occupation and industry characteristics dominate thereafter." The findings coupled with those shown in Figure 2 suggests the increasing importance of the role of industry in explaining the gender wage gap in Taiwan.

In addition to the work by Zvegligh, Rodgers and Rodgers III (1997), quite a few empirical studies have focused on the examination of gender wage gaps in Taiwan. For example, Gannicott (1986) found that unexplained portion of the female-male wage gap accounts for around 60% based on the 1982 manpower utilization survey data. Liu and Liu (1987) found a significant gender wage gap in the labor market of Taiwan and the gap differed for workers across occupations. Lin (1988)'s study focused on the gender wage gap of the entry-level workers. Kao et al. (1994) incorporated the concept of life-cycle human capital investment (i.e., Polachek's expected human capital approach) into their analysis based on the 1989 micro data of Taiwan and found that more than 80% of the gender wage gap can be explained by the difference of the expected investment in the human capital between males and females. Tan (1998) applied the Oaxaca-Blinder decomposition model with the consideration of the sample selection bias to examine the gender wage gap for workers in the public sector and the private sector repectively. Tseng (2001) studied the changes in the gender wage gap and found that the unexplained portion of the gender wage gap has increased from 55% to 67% and then to 74% based on the 1982, 1992 and 2000 data.

Most of the existing literature on the gender wage gap in Taiwan has applied the Oaxaca-Blinder decomposition framework and the industry variables in these studies are generally treated as control variables specified in the earning equations. However, in order to recognize the interindustry variation in the gender wage gap, the econometric method used in most recent empirical works usually apply the measure of gender wage gaps by industry proposed in Fields and Wolff (1995) and Horrace and Oaxaca (2001). See Rycx and Tojerow (2002), Adamchik and Bedi (2003), and Gannon et al. (2005). One recent study by Hsu, Chen and Fang (2006), focusing on the examination of the change of industrial structure and gender wage gap in Taiwan, have applied some of the interindustry gender wage gap indicators developed in Fields and Wolff (1995) and Horrace and Oaxaca (2001). Their results indicate that gender wage gap is higher in the physical-intensive industries such as the manufacture industry while the wage gap is lower in mind-intensive industries such as the financial and insurance industry and communication industry.

Although Hsu, Chen and Fang (2006) have provided the industry ranking results of the gender wage gap based on the data of Taiwan, standard errors for the wage gaps are not reported in their study. Standard errors are critical if one is interested in determining whether or not differences in the wage gap across industries are statistically meaningful. In this study, we will first examine the interindustry wage differentials for male and female workers over the time period from 1978 to 2003 to provide an overview of the gender wage differentials across various industries. Then, we will apply the recently developed approach of interindustry gender wage gap measures by Horrance and Oaxaca (2001) to calculate the estimated gender wage gap by industry and the corresponding standard errors.

The paper is organized as follows. The next section will investigate the pattern of interindustry wage differentials for men and women in Taiwan based on the 1978-2003 Manpower Utilization Survey (MUS) data. In section 3, we briefly describe the econometric methods utilized in this paper to measure the gender wage gap by industry. Section 4 presents and discusses the empirical results of various estimates of the interindustry gender wage gap. The final section concludes the paper.

2 Interindustry Wage Differentials by Gender

In order to have some idea of the interindustry wage differentials among male and female workers, we first examine the pattern of interindustry wage differentials separately for women and men in Taiwan based on data drawn from the 1978-2003 MUS. Following Krueger and Summers (1988), we define the interindustry wage differential $\dot{d}_j$ for industry j as:

$$\dot{d}_j = \hat{\beta}_j - [\sum_k \hat{\beta}_k \cdot s_k], \tag{2.1}$$

where $\hat{\beta}_j$ is the coefficient of the dummy in industry j and s_k is the proportion of the workers employed in industry k. Usually, the term $[\sum_k \hat{\beta}_k \cdot s_k] \equiv \dot{d}$ refers to "employment-weighted industry wage differential". Our regression equation is a standard log-earnings function of the following form:

$$y_i^f = \alpha^f + x_i^f \theta^f + \sum_{j=2}^{J} \beta_j^f d_{ij}^f + \sum_{k=2}^{K} \pi_k^f q_{ik}^f + \varepsilon_i^f; \tag{2.2}$$
$$i = 1, ..., F;\ j = 1, ..., J;\ k = 1, ..., K$$
$$y_i^m = \alpha^m + x_i^m \theta^m + \sum_{j=2}^{J} \beta_j^m d_{ij}^f + \sum_{k=2}^{K} \pi_k^m q_{ik}^f + \varepsilon_i^m; \tag{2.3}$$
$$i = 1, ..., M;\ j = 1, ..., J;\ k = 1, ..., K,$$

where (2.2) and (2.3) represent the log-wage regressions for F female and M male workers, respectively. Superscript f denotes female and m denotes male. y_i is the logarithm of hourly wage and x_i is a vector of continuous characteristic regressors. d_{ij} is a dummy variable that equals one if the ith worker is employed in the jth industry and equals zero otherwise. Other set of dummy variables are captured by q_{ik} which may contain categorical variables such as marital status or race. For simplicity we only consider one set of dummy variables other than industry dummies.[1] Without loss of generality, the first category is set as the

[1]Extension of our model to more sets of dummy variables is straightforward.

left-out reference group both in J and K classifications. i.e. $d_{i1} = q_{i1} = 0$. α, θ, β, and π are parameters to be estimated. ε_i is the disturbance term which is assumed to satisfy the classical assumptions such as i.i.d. and homoskedasticity.

Our variable of greatest interest here is d_{ij}. There are 7 industry dummy variables in our specification with the mining industry as the reference group. OLS regressions are estimated separately for male and female workers for each year over our sample period. Most of the coefficients on the industry dummies are significant, even though the earnings function controls for schooling, experience, tenure, marital status, occupation, urban and region.[2] Based on the estimated coefficients of the industry dummies, we can calculate the interindustry wage differentials for male and female workers respectively according to equation (2.1).

Table 1 presents summary results of the interindustry wage differentials for men and women in Taiwan over our sample period from 1978 to 2003. The maximum and minimum values for $\dot{d}_j$ by gender and year, as well as the range and adjusted standard deviation of $\dot{d}$ are shown in Table 1.[3] For the first year of our sample period, 1978, interindustry wage differentials among men run from a high of 0.16 (Construction industry) to a low of -0.16 (Service industry) with a range of 0.32, while the variation of interindustry wage differentials among women is larger ranging from the high of 0.25 to the low of -0.17. It is noticed that the ranges of interindustry wage differentials are higher among female workers than those among male workers for most years and the adjusted standard deviations are higher for females than for males at each year of our sample periods. These results indicate there is more dispersion in $\dot{d}_j$ among female worker than among male workers.

For all of our samples, the largest range of interindustry wage differentials is observed in 1983 among female workers while the smallest one occurred in 2003 among male workers. It is noteworthy that before the year of 1999, the range of interindustry wage differentials for both genders in most years is higher than 0.3 and the discrepancy between the range of male workers and that of female workers is relatively large. However, starting from the year of 1999, the range of interindustry wage differential becomes smaller, and the discrepancy between the range of male workers and that of female workers is also smaller. Compared

[2]The OLS regression results can be obtained from the authors upon request.

[3]Please see the Appendix for the computation of the adjusted standard deviation of $\dot{d}$.

to the range of interindustry wage differentials of all workers, it is noticed that the ranges among male workers are smaller than that among all workers and the ranges among female workers are larger for most years in our sample period.

The corresponding industries of the maximum and minimum value of $\dot{d}_j$ are also reported in Table 1. For the year of 1978, construction was the industry with the highest wage differential for both male and female worker. A female worker in the Construction industry earned 25% higher wages than the average female worker among all industries and a male worker in the Construction industry earned only 16% higher wages than the average male worker among all industries. It is worth noticing that the Construction industry continues to be the industry with the highest wage differential for female workers during the years from 1978 to 1994. Starting from 1995, Construction and Mining industries alternately occupy the position of the highest wage differential for female workers. For male workers, the Construction and Mining industries represent the industry with the highest wage differential randomly during our sample period. The percentage of the above average wages for the highest wage differential industry ranges from 10% (2003) to 29% (1982) for male workers and this range is from 15% (1999, 2001, 2003) to 36% (1995) for female workers.

There is less common in the industry representing the lowest wage differential for both men and women. Industries that have ever become the lowest wage differential industry for male workers include Service industry, Agriculture, as well as Business industry. For female worker, those industries with the lowest wage differential are Mining industry, Service industry, and Agriculture industry. The percentage of the below average wages for the lowest wage differential industry ranges from 7% (1999) to 34% (1992) for male workers and this range is from 4% (1999) to 37% (1980) for female workers. These ranges for both men and women are higher than the ranges of the above average wages for the highest wage differentials industry for both genders.

3 Econometric methodology

Fields and Wolff (1995) extends the Oaxaca-Blinder detailed decomposition to allow for industry dummies so that we can investigate the pattern of interindustry wage differential separately for female and male. Consider the standard log-wage model shown in (2.2) and

(2.3). We can compute the log-wage for a representative male and a representative female worker in industry j by averaging the fitted values in (2.2) and (2.3) for all persons in industry j as follows:

$$\hat{y}_j^f = \hat{\alpha}^f + \bar{x}_j^f \hat{\theta}^f + \hat{\beta}_j^f + \sum_{k=2}^{K} \hat{\pi}_k^f \bar{q}_{jk}^f$$
$$\hat{y}_j^m = \hat{\alpha}^m + \bar{x}_j^m \hat{\theta}^m + \hat{\beta}_j^m + \sum_{k=2}^{K} \hat{\pi}_k^m \bar{q}_{jk}^m,$$

where $\bar{x}_j^f$ and $\bar{q}_{jk}^f$ ($\bar{x}_j^m$ and $\bar{q}_{jk}^m$) are the mean characteristics of a representative female (male) worker in the jth industry. Also "hat" denotes the estimated counterpart of the true parameter throughout this paper. Using the strategy introduced in Oaxaca (1973) and Blinder (1973) one could decompose the gender wage gap in industry j into unexplained (coefficients effects) and explained components (characteristics effects) as follows:

$$\hat{y}_j^f - \hat{y}_j^m = \left(\hat{\alpha}^f - \hat{\alpha}^m\right) + (\hat{\beta}_j^f - \hat{\beta}_j^m) + \bar{x}_j^f \left(\hat{\theta}^f - \hat{\theta}^m\right) + \sum_{k=2}^{K} (\hat{\pi}_k^f - \hat{\pi}_k^m) \bar{q}_{jk}^f \qquad (3.1)$$
$$+ \sum_{k=2}^{K} \hat{\pi}_k^m (\bar{q}_{jk}^f - \bar{q}_{jk}^m) + (\bar{x}_j^f - \bar{x}_j^m) \hat{\theta}^m,$$

where the first four terms on the right hand side of (3.1) are the unexplained components, while the last two terms correspond to the explained wage gap in industry j. Fields and Wolff (1995) define the industry gender wage gap for industry j as:

$$\hat{g}_j = \left(\hat{\alpha}^f - \hat{\alpha}^m\right) + (\hat{\beta}_j^f - \hat{\beta}_j^m) \qquad (3.2)$$

Since $\hat{g}_j$ is not invariant to the choice of the left-out reference group, Horrace and Oaxaca (2001) then propose four alternatives:[4]

$$\hat{\phi}_j = (\hat{\alpha}^f - \hat{\alpha}^m) + (\hat{\beta}_j^f - \hat{\beta}_j^m) + \bar{x}_j^f(\hat{\theta}^f - \hat{\theta}^m) + \sum_{k=2}^{K}(\hat{\pi}_k^f - \hat{\pi}_k^m)\bar{q}_{jk}^f \tag{3.3}$$

$$\hat{\delta}_j = (\hat{\alpha}^f - \hat{\alpha}^m) + (\hat{\beta}_j^f - \hat{\beta}_j^m) + \bar{x}^f(\hat{\theta}^f - \hat{\theta}^m) + \sum_{k=2}^{K}(\hat{\pi}_k^f - \hat{\pi}_k^m)\bar{q}_k^f \tag{3.4}$$

$$\hat{\gamma}_j = \max_{n=1\ldots J} \hat{g}_n - \hat{g}_j = \max_{n=1\ldots J} \hat{\delta}_n - \hat{\delta}_j \tag{3.5}$$

$$\hat{\rho}_j = \max_{n=1\ldots J} \hat{\phi}_n - \hat{\phi}_j \tag{3.6}$$

It is worth noting that the rankings of the measures are divided into two groups. One is for the measures ($\hat{g}$, $\hat{\delta}$, $\hat{\gamma}$) and the other one is for ($\hat{\phi}$, $\hat{\rho}$). By inspecting the definition of the measures, the index in each group shares the same ranking, even though the rankings are not the same for the two groups. Also note that the higher the ranking (smaller in ranking number) is, the smaller the gender wage gap for a specific industry. We have to mention that none of the above measures can dominate because each of them has some advantages as well as disadvantages. For instance, the measures $\hat{\phi}_j$ and $\hat{\delta}_j$ are not identified in the sense that they are not invariant to the choice of the unobservable non-discriminatory wage structure (Neumark, 1988). One will also suffer from the finite sample bias problem when implementing the hypothesis test based on measure $\hat{\gamma}_j$. To get more accurate standard error of $\hat{\gamma}_j$, however, we need to simulate the critical values (Horrace, 2005). In addition, $\hat{\phi}_j$ and $\hat{\delta}_j$ depend upon personal characteristics which may dominate or distort the true coefficient effects (Horrace and Oaxaca, 2001). The standard errors for $\hat{\phi}_j$ and $\hat{\delta}_j$ are obtained according to the fixed regressors assumption on $\bar{x}_j^f$ and $\bar{x}^f$. In general, $\bar{x}_j^f$ and $\bar{x}^f$ should be considered stochastic and will in turn inflate the standard errors for $\hat{\phi}_j$ and $\hat{\delta}_j$. See Lin (2006) for more discussion on this issue. Recent work by Ural, Horrace and Jung (2006) makes an effort to eliminate the identification problems addressed above using the relative measures. It would be interesting to develop a new estimator which is immune to the disadvantages of the existing measures.

[4] The measure $\hat{\rho}_j$ can be viewed as an extension of $\hat{\gamma}_j$ and is defined in Table 4 of Horrace and Oaxaca (2001).

4 Estimation Results of the Gender Wage Gap by Industry

The data sets, Manpower Utilization Survey, in this paper are acquired from the Directorate-General of Budget, Accounting and Statistics, Executive Yuan in Taiwan. The survey has been conducted annually since 1978 with an aim of understanding manpower utilization in the Taiwan Area. The data used in this study ranges from 1978 to 2003. We will estimate the Mincerian wage equations for males and female in each year. The MUS data includes the information of the wages for females and males as well as control variables such as education, potential experience,[5] squared potential experience, job tenure, squared job tenure, a binary variable for marital status,[6] three binary variables for living area,[7] six dummy variables for occupations,[8] and seven dummy variables for industry[9] specified in our log-wage equation. The dependent variable is the logarithm of the hourly wage, which is the monthly wage divided by (weekly working hours $\times$ 4.33 weeks). The split regression results show that the (log) wage equations are concave in job tenures.[10] The level of the experiences and job tenures are higher for men than for women. The marriage premium is positive for males in most years but negative for females in several years.

Following the description of the various measurements of the interindustry gender wage gap, we calculate these measurements and the corresponding standard errors. These estimation results are reported in Tables 2 (a)-(f). As expected, most of the industry gender wage gaps are negative, as male workers generally earn more than female workers, after controlling for productivity-related individual characteristics of workers. Positive signs are found only for the measurement, $\hat{g}$, proposed by Fields and Wolff (1995).

In terms of the statistical significance, the estimates of $\hat{g}$ for most industries are sta-

[5]It is measured as age – years of schooling – 6.

[6]The dummy variable equals 1 for married and 0 for separated, divorced, widowed, never married.

[7]Living areas include the northern, middle, and southern parts of Taiwan with south as the reference region.

[8]There are seven occupational categories in the census data. We set up six dummies including Exec., Admin. & Managerial, Professoional Specialty, Sevice, Technicians, Machine Operator, and Non-technician.

[9]The industries in the MUS data are classified into eight categories, which consist of Mining, Agriculture, Durables Manufacturing, Construction, Business, Transp. & Communication, Finance, Insurance & Real Estate, and Social & Personal Services, with Mining as the reference group.

[10]To save space, the tables of the split regression results conducted for the 26 years from 1978 to 2003 are available upon request.

tistically insignificant in our sample period except for the years from 1989 through 1992. However, almost all the estimates of $\hat{\phi}$ for every industry are statistically significant for each year in our sample period. As to $\hat{\delta}$, the majority of the estimates are statistically significant. Therefore, our discussion about the magnitudes and ranking will mainly base on the estimated values of $\hat{\delta}$ and $\hat{\phi}$. The magnitude of the wage gap indicates that, for the year of 2003, the Finance industry shows the smallest gap (-0.1453 based on $\hat{\delta}$ and -0.1097 based on $\hat{\phi}$) and the Agriculture industry has the largest gap (-0.3581 based on $\hat{\delta}$ and -0.2813 based on $\hat{\phi}$). These figures suggest that the interindustry wage differential for women in the Finance industry is 14.53% (based on $\hat{\delta}$ and 10.97% based on $\hat{\phi}$) below that for men and in the Agriculture industry, women have a wage differential 35.81% (based on $\hat{\delta}$ and 28.13% based on $\hat{\phi}$) below that for men. In other words, there are smaller interindustry wage differential between male and female workers in the Finance industry while the wage differential between men and women are larger in the Agriculture industry in 2003.

As to the ranking of industries, the Mining industry continues to occupy the lowest ranking (the 8^{th}) for the years from 1978 to 1991 based on either $\hat{\delta}$ or $\hat{\phi}$. That is, female workers in the Mining industry face the largest gender wage gap compared to those in other industries during the years 1978 through 1991. After the year 1991, the Mining industry is not necessary the most discriminating industry to female workers. The industry ranking the highest (the 1^{th}) to female workers varies year by year for different measurement. For example, it is the Agriculture industry for the year of 1978, and turns to the Finance industry for the year of 2003 based on the measurement of $\hat{\delta}$. However, the first ranking industry to female workers is the Business industry in 1978 and it also becomes the Finance industry in 2003 based on the measurement of $\hat{\phi}$.

In order to have a more general idea of the pattern of industry ranking of gender wage gap, the highest and lowest ranking industry and the corresponding estimated gender wage gap as well as the range of the highest and lowest ranking industry are reported in Table 3. It is noticed that the Finance industry represents the highest ranking industry for each year from 1996 to 2003 based on the measurement of $\hat{\phi}$. In other words, female workers in the Finance industry have the least discrimination compared to workers in other industries in the past decade. Over all the sample period, the least discriminating industry to female workers includes the Agriculture, Business, Construction, Service, Mining and Finance industries though the Finance industry takes this position most frequently. The most discriminating industry to women includes Mining, Service, Agriculture, and Manufacture industries and the Mining industry is the most likely to be the least favorite to women in terms of wages.

It is worth mentioned that the range of the gender wage gap between the highest and the lowest ranking industries reported in Table 3 indicates that the range based on the measurement of $\hat{\delta}$ is smaller than that based on the measurement of $\hat{\phi}$ for most years. In addition, the range is smaller after year 1999, suggesting that there is less variation in the interindustry gender wage gap during the most recent years. Finally, it is found that similar implications can be derived from the results of Table 1 and Table 3. The interindustry wage differentials for female workers shown in Table 1 suggest that female workers in the Construction industry have received better wages compared to female workers in other industries. This wage premium makes Construction the highest ranking industry of the gender wage gap for most years based on the measurement of $\hat{\delta}$ reported in Table 3. In other words, female workers in the Construction industry are not only better off in wages among all female workers, but also receive less discrimination compared to the wage rate of male workers.

5 Conclusion

Since Taiwan's industry and export mixes have shifted toward higher-skill, technology-intensive products, and lower-skill, labor-intensive industries have moved abroad, largely to Mainland China, we expect to observe changes in the interindustry wage differentials for both male and female workers. These changes are very likely to lead to the variation in the pattern of gender wage gaps across industries. Therefore, this paper aims to examine the interindustry wage differentials for male and female workers over time, and apply the recently developed approach of interindustry gender wage gap measures to calculate the estimated gender wage gap by industry and the corresponding standard errors based on the 1978-2003 Manpower Utilization Survey data.

Our estimation results of the interindustry wage differentials for male and female workers over time indicate that either the Construction or the Mining industry takes the position of the highest wage differential for both male and female workers. A female worker in the highest wage differential industry earned 15% to 36% higher wages than the average female worker among all industries and a male worker in the highest wage differential industry earned 10% to 29% higher wages than the average male worker among all industries. However, there is less common in the industry representing the lowest wage differential for both men and women. As to the range of the interindustry wage differentials, the largest range is observed in 1983 among female workers while the smallest one occurred in 2003 among male workers. Moreover, the ranges among male workers are smaller than that among all workers and the ranges among female workers are larger for most years in our sample period compared to the range of interindustry wage differentials for all workers.

The findings regarding the interindustry gender wage gaps indicate that the interindustry wage differential for women in the Finance industry is 11-15% below that for men and in the Agriculture industry, women have a wage differential 28-36% below that for men for the year of 2003. Female workers in either the Mining industry or the Agriculture industry face the largest gender wage gap compared to those in other industries for most years during our sample period. In addition, findings from the most recent years suggest that there is less variation in the interindustry gender wage gap, and female workers in the Finance industry have the least discrimination compared to workers in other industries. Finally, the common implications derived from the interindustry wage differentials for female workers and the interindustry gender wage gap is that female workers in the Construction industry are not only better off in terms of wages among all female workers, but also receive less discrimination compared to the wage of male workers.

A Appendix

This note explains how to compute the standard errors for the "STD" of Fields and Wolff (1995) on page 108 Table 1. First, by Krueger and Summers (1988), we can define the interindustry wage differential $\dot{d}_j$ for industry j as:

$$\dot{d}_j = \hat{\beta}_j - [\sum_k \hat{\beta}_k \cdot s_k],$$

where $\hat{\beta}_j$ is the coefficient of the dummy in industry j and s_k is the proportion of the workers employed in industry k. Assume the total number of industries is $K+1$. (so that we have

K industry dummies and the $(K+1)$th industry is the reference group) Usually, the term $[\sum_k \hat{\beta}_k \cdot s_k]$ refers to "employment-weighted industry wage differential". In fact, the reported "STD"s in Table 1 of Fields and Wolff (1995) are the standard errors for the term $[\sum_k \hat{\beta}_k \cdot s_k]$. Now the question is reduced to compute the variance of $[\sum_k \hat{\beta}_k \cdot s_k]$:

$$\text{var}[\sum_{k=1}^{K} \hat{\beta}_k \cdot s_k] = \text{var}[s'\hat{\beta}] = s'\text{var}[\hat{\beta}]s, \tag{A.1}$$

where $s = (s_1, ...s_k..., s_K)'$, $\hat{\beta} = (\hat{\beta}_1, ...\hat{\beta}_k..., \hat{\beta}_K)'$, and $\text{var}[\hat{\beta}]$ could be easily yielded from the separate wage equations of females and males.

If our goal is to compute the standard error for the index $\dot{d}_j$ for each industry j and j runs from 1 to $K+1$, (since for the reference group we have $\dot{d}_{K+1} = -[\sum_k \hat{\beta}_k \cdot s_k]$) then:

$$\text{var}[\dot{d}] = \text{var}[W\hat{\beta} - \iota s'\hat{\beta}] = (W - \iota s')\text{var}[\hat{\beta}](W - \iota s')', \tag{A.2}$$

where $\dot{d} = (\dot{d}_1, ..., \dot{d}_{K+1}), W$ is the $(K+1)\times K$ matrix constructed by a $K \times K$ identity matrix and a $1 \times K$ row vector of zeros, and ι is a column vector of ones. Extracting the diagonal element of $\text{var}[\dot{d}]$ gives the squared standard error for $\dot{d}_j$, $j = 1, ..., K+1$.

To sum up, if we want to compute the "STD" of Table 1 in Fields and Wolff (1995), (A.1) is the formula. If we need to report the standard error for each industry, one has to apply the formula in (A.2).

References

[1] Adamchik, V. A. and A. S. Bedi (2003): "Gender Pay Differentials During the Transition in Poland," *Economics of Transition*, 11(4), 697-726.

[2] Blinder, A. S. (1973): "Wage Discrimination: Reduced Form and Structural Estimates," *Journal of Human Resources*, 8(4), 436-455.

[3] Fields, J. and E. M. Wolff (1995): "Interindustry Wage Differentials and the Gender Wage Gap," *Industrial and Labor Relations Review*, 49(1), 105-120.

[4] Gannicott, K. (1986): "Women, Wages, and Discrimination: Some Evidence from Taiwan," *Economic Development and Cultural Change*, 34(3), 721-730.

[5] Gannon, B., R. Plasman, F. Rycx, and I. Tojerow (2005): "Inter-Industry Wage Differentials and the Gender Wage Gap: Evidence from European Countries," IZA Discussion Papers No. 1563, Institute for the Study of Labor (IZA).

[6] Horrace, W. C. (2005): "On the Ranking Uncertainty of Labor Market Wage Gaps," *Journal of Population Economics*, 18, 181–187.

[7] Horrace, W. C. and R. Oaxaca (2001): "Inter-Industry Wage Differentials and the Gender Wage Gap: An Identification Problem," *Industrial and Labor Relations Review*, 54(3), 611-618.

[8] Hsu, M., B. Chen, and J. Fang (2006): "The Effects of Industrial Structrure and Sex Discrimination on Changes in Female and Male Wage Differential in Taiwan," *Academia Economic Papers*, 34(4), 505-539.

[9] Kao, C., S. Polachek, and P. Wunnava (1994): "Male-Female Wage Differentials in Taiwan: A Human Capital Approach," *Economic Development and Culture Change*, 42(2), 351-374.

[10] Krueger, A. B. and L. H. Summers (1988): "Efficiency Wages and the Inter-Industry Wage Structure," *Econometrica*, 56(2), 259-293.

[11] Lin, C. (1988): "Sex Differences in Hourly Earnings at Entry Levels: The Case of Taiwan," *Taiwan Economic Review*, 16(3), 305-322.

[12] Lin, E. S. (2006): "On the Standard Errors for the Gender Wage Differential by Industry Estimator," Working Paper, Department of Economics, National Tsing Hua University.

[13] Liu, J-T, and J-L Liu (1987): "Male-Female Wage Differentials in Taiwan," The Chinese Economic Association Annual Conference Proceedings, 107-136.

[14] Neumark, D. (1988): "Employers' Discriminatory Behavior and the Estimation of Wage Discrimination," *Journal of Human Resources*, 23(3), 279-295.

[15] Oaxaca, R. (1973): "Male-Female Wage Differentials in Urban Labor Markets," *International Economic Review*, 14(3), 693-709.

[16] Oaxaca, R. and M. R. Ransom (1999): "Identification in Detailed Wage Decomposition," *Review of Economics and Statistics*, 81(1), 154-157.

[17] Rycx, F. and I. Tojerow (2002): "Inter-Industry Wage Differentials and the Gender Wage Gap in Belgium," *Brussels Economic Review*, 45(2), 119-141.

[18] Tan, L. (1998): "Gender Wage Differentials in Private and Public Sector Jobs for Taiwan," Proceedings of the National Science Council, Republic of China, Pt. C: Humanities and Social Sciences, 8(2), 335-348.

[19] Tseng, M. (2001): "The Changes of Gender Differences in Earings in Taiwan: 1982, 1992 and 2000," *Journal of Population Studies*, 23, 147-199.

[20] Ural, B. P., W. C. Horrace, and J. H. Jung (2006): "Inter-Industry Gender Wage Gaps by Knowledge Intensity: Discrimination and Technology in Korea," Working Papers No. 79, Center for Policy Research, Maxwell School, Syracuse University.

[21] Zveglich, J. E., Y. van der M. Rodgers, W. M. Rodgers III (1997): "The Persistence of Gender Earnings Inequality in Taiwan, 1978-1992," *Industrial and Labor Relations Review*, 50(4), 594-609.

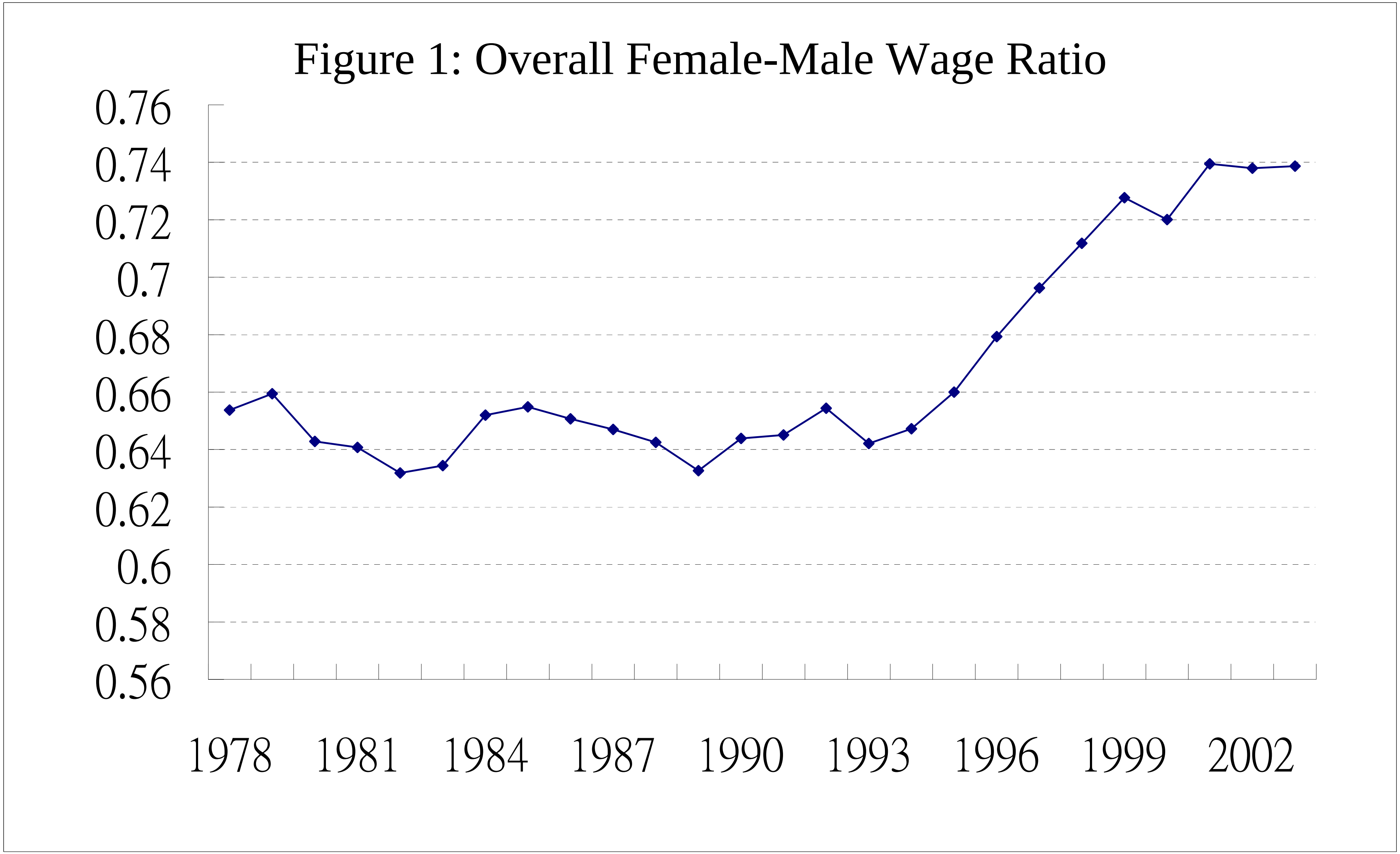
Figure 1: Overall Female-Male Wage Ratio
0.76
0.74
0.72
0.7
0.68
0.66
0.64
0.62
0.6
0.58
0.56
1978
1981
1984
1987
1990
1993
1996
1999
2002

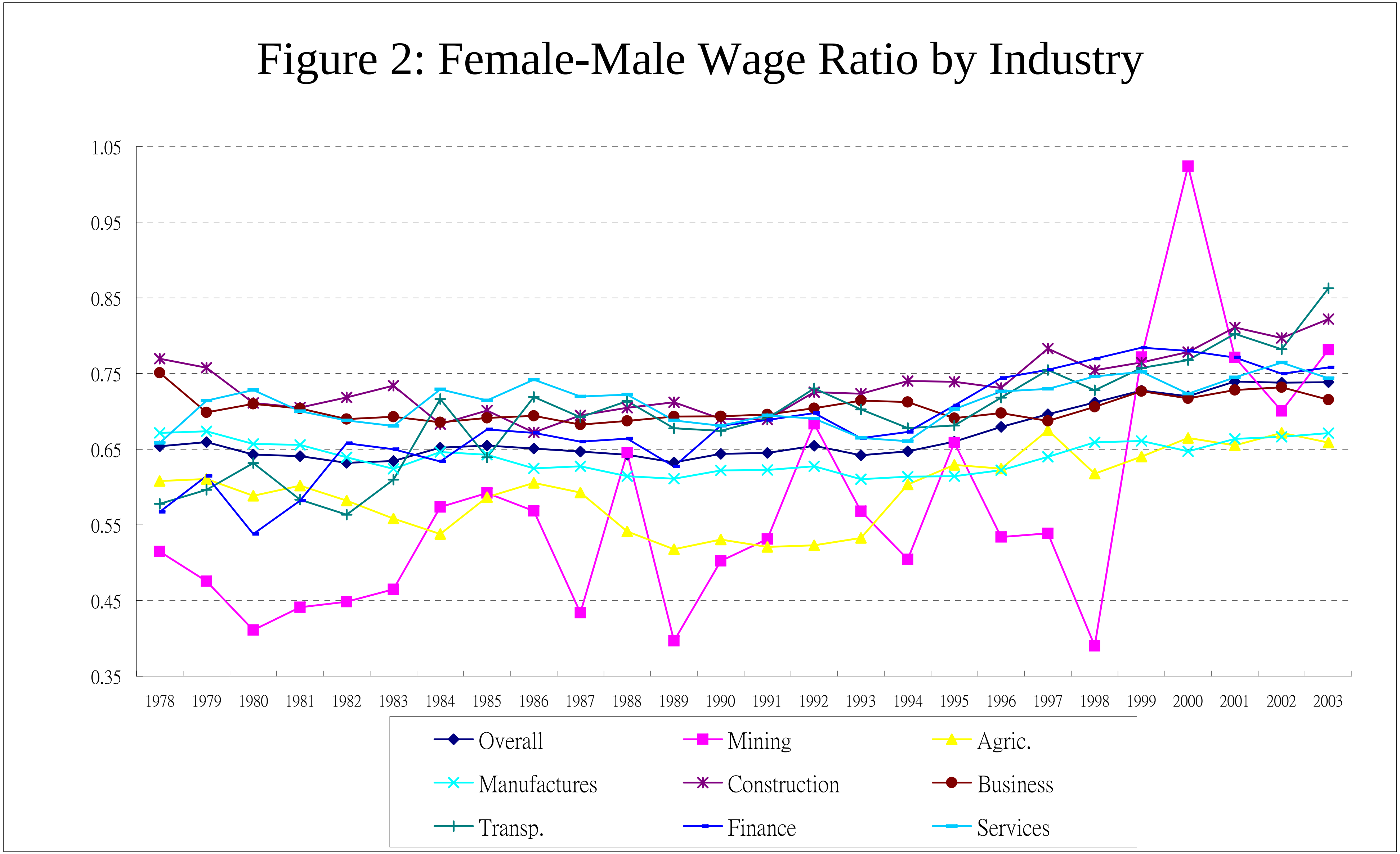
Figure 2: Female-Male Wage Ratio by Industry
1.05
0.95
0.85
0.75
0.65
0.55
0.45
0.35
1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003
Overall
Mining
Agric.
Manufactures
Construction
Business
Transp.
Finance
Services

Table 1 : Interindustry Wage Differentials by Gender and Years

Year	Sample	Industry wage premium	Max		Min		Range	STD	Sample Size
1978	**Male**	-0.09	+0.16	(Construction)	-0.16	(Services)	0.32	0.03	8,028
	Female	+0.17	+0.25	(Construction)	-0.17	(Mining)	0.42	0.07	4,290
	ALL	-0.12	+0.23	(Construction)	-0.18	(Services)	0.40	0.03	12,318
1979	**Male**	-0.07	+0.12	(Construction)	-0.21	(Services)	0.32	0.03	8,627
	Female	+0.14	+0.26	(Construction)	-0.16	(Services)	0.42	0.08	4,747
	ALL	-0.11	+0.19	(Construction)	-0.20	(Services)	0.38	0.03	13,374
1980	**Male**	-0.17	+0.17	(Mining)	-0.21	(Services)	0.38	0.03	8,828
	Female	+0.37	+0.22	(Construction)	-0.37	(Mining)	0.59	0.07	4,909
	ALL	-0.16	+0.19	(Construction)	-0.18	(Services)	0.38	0.03	13,737
1981	**Male**	-0.25	+0.25	(Mining)	-0.17	(Services)	0.41	0.03	9,523
	Female	+0.07	+0.25	(Construction)	-0.11	(Services)	0.36	0.07	5,150
	ALL	-0.27	+0.27	(Mining)	-0.15	(Services)	0.42	0.03	14,673
1982	**Male**	-0.29	+0.29	(Mining)	-0.17	(Services)	0.46	0.03	9,256
	Female	+0.14	+0.25	(Construction)	-0.25	(Agriculture)	0.50	0.07	5,229
	ALL	-0.32	+0.32	(Mining)	-0.17	(Services)	0.49	0.03	14,485
1983	**Male**	-0.10	+0.15	(Construction)	-0.13	(Services)	0.28	0.03	9,030
	Female	+0.29	+0.34	(Construction)	-0.29	(Mining)	0.63	0.07	5,422
	ALL	-0.11	+0.26	(Construction)	-0.14	(Services)	0.40	0.03	14,452
1984	**Male**	-0.17	+0.17	(Construction)	-0.17	(Agriculture)	0.33	0.05	9,523
	Female	-0.05	+0.24	(Construction)	-0.13	(Services)	0.37	0.14	6,025
	ALL	-0.21	+0.26	(Construction)	-0.15	(Services)	0.41	0.05	15,548
1985	**Male**	-0.19	+0.19	(Mining)	-0.12	(Services)	0.31	0.04	9,673
	Female	-0.06	+0.21	(Construction)	-0.12	(Services)	0.32	0.08	6,068
	ALL	-0.25	+0.25	(Mining)	-0.12	(Services)	0.37	0.03	15,741
1986	**Male**	-0.23	+0.23	(Mining)	-0.13	(Services)	0.36	0.04	9,640
	Female	-0.06	+0.22	(Construction)	-0.08	(Services)	0.30	0.07	6,363
	ALL	-0.26	+0.26	(Mining)	-0.12	(Services)	0.38	0.04	16,003
1987	**Male**	-0.24	+0.24	(Mining)	-0.14	(Services)	0.39	0.05	10,257
	Female	+0.10	+0.25	(Construction)	-0.11	(Services)	0.36	0.10	7,191
	ALL	-0.27	+0.27	(Mining)	-0.14	(Services)	0.41	0.04	17,448
1988	**Male**	-0.21	+0.21	(Mining)	-0.10	(Agriculture)	0.32	0.04	10,320
	Female	-0.18	+0.26	(Construction)	-0.12	(Services)	0.38	0.13	7,015
	ALL	-0.29	+0.29	(Mining)	-0.12	(Services)	0.41	0.05	17,335
1989	**Male**	-0.18	+0.18	(Mining)	-0.09	(Services)	0.26	0.04	10,361
	Female	+0.19	+0.28	(Construction)	-0.19	Mining	0.47	0.12	6,934
	ALL	-0.22	+0.27	(Construction)	-0.11	(Services)	0.38	0.04	17,295
1990	**Male**	-0.13	+0.17	(Construction)	-0.20	(Agriculture)	0.37	0.04	10,197
	Female	+0.12	+0.32	(Construction)	-0.14	(Agriculture)	0.46	0.12	6,724
	ALL	-0.16	+0.29	(Construction)	-0.13	(Services)	0.41	0.05	16,921
1991	**Male**	-0.07	+0.15	(Construction)	-0.09	(Services)	0.24	0.05	9,886
	Female	+0.10	+0.28	(Construction)	-0.10	(Services)	0.38	0.10	6,703
	ALL	-0.10	+0.27	(Construction)	-0.12	(Services)	0.39	0.05	16,589

Table 1 : Interindustry Wage Differentials by Gender and Years (continued)

Year	Sample	Industry wage premium	Max		Min		Range	STD	Sample Size
1992	**Male**	+0.10	+0.16	(Construction)	-0.34	(Agriculture)	0.51	0.05	9,926
	Female	-0.08	+0.34	(Construction)	-0.14	(Agriculture)	0.48	0.16	6,570
	ALL	+0.01	+0.29	(Construction)	-0.27	(Agriculture)	0.55	0.05	16,496
1993	**Male**	-0.12	+0.14	(Construction)	-0.08	(Business)	0.22	0.04	10,931
	Female	+0.02	+0.28	(Construction)	-0.19	(Agriculture)	0.46	0.11	7,027
	ALL	-0.21	+0.22	(Construction)	-0.09	(Manufacture)	0.31	0.04	17,958
1994	**Male**	-0.11	+0.13	(Construction)	-0.10	(Agriculture)	0.23	0.04	11,157
	Female	+0.15	+0.29	(Construction)	-0.15	(Mining)	0.44	0.11	7,300
	ALL	-0.17	+0.21	(Construction)	-0.10	(Manufacture)	0.31	0.04	18,457
1995	**Male**	-0.04	+0.15	(Construction)	-0.18	(Agriculture)	0.33	0.04	11,158
	Female	-0.36	+0.36	(Mining)	-0.14	(Agriculture)	0.51	0.15	7,423
	ALL	-0.19	+0.22	(Construction)	-0.15	(Agriculture)	0.37	0.04	18,581
1996	**Male**	-0.13	+0.16	(Construction)	-0.09	(Business)	0.25	0.05	10,452
	Female	+0.19	+0.25	(Construction)	-0.19	(Mining)	0.44	0.14	7,341
	ALL	-0.22	+0.22	(Construction)	-0.08	(Services)	0.30	0.05	17,793
1997	**Male**	-0.20	+0.20	(Mining)	-0.12	(Agriculture)	0.32	0.05	10,538
	Female	+0.07	+0.27	(Construction)	-0.16	(Agriculture)	0.43	0.09	7,329
	ALL	-0.21	+0.22	(Construction)	-0.15	(Agriculture)	0.36	0.05	17,867
1998	**Male**	-0.24	+0.24	(Mining)	-0.10	(Agriculture)	0.34	0.05	10,996
	Female	+0.15	+0.19	(Construction)	-0.35	(Agriculture)	0.53	0.10	7,680
	ALL	-0.25	+0.25	(Mining)	-0.15	(Agriculture)	0.40	0.05	18,676
1999	**Male**	-0.14	+0.14	(Mining)	-0.07	(Business)	0.21	0.05	10,825
	Female	-0.07	+0.15	(Construction)	-0.04	(Manufacture)	0.19	0.10	7,483
	ALL	-0.21	+0.21	(Mining)	-0.05	(Manufacture)	0.26	0.04	18,308
2000	**Male**	-0.09	+0.12	(Construction)	-0.08	(Business)	0.20	0.05	10,907
	Female	-0.15	+0.16	(Construction)	-0.05	(Agriculture)	0.22	0.14	7,626
	ALL	-0.18	+0.18	(Mining)	-0.05	(Manufacture)	0.23	0.05	18,533
2001	**Male**	-0.12	+0.13	(Construction)	-0.10	(Agriculture)	0.23	0.04	10,405
	Female	-0.15	+0.15	(Mining)	-0.23	(Agriculture)	0.38	0.23	7,634
	ALL	-0.22	+0.22	(Mining)	-0.13	(Agriculture)	0.36	0.04	18,039
2002	**Male**	-0.09	+0.11	(Construction)	-0.11	(Agriculture)	0.22	0.05	10,841
	Female	-0.07	+0.17	(Construction)	-0.10	(Agriculture)	0.28	0.16	7,980
	ALL	-0.20	+0.20	(Mining)	-0.09	(Agriculture)	0.28	0.05	18,821
2003	**Male**	-0.07	+0.10	(Construction)	-0.09	(Business)	0.18	0.05	10,624
	Female	-0.01	+0.15	(Construction)	-0.07	(Agriculture)	0.22	0.15	7,815
	ALL	-0.16	+0.16	(Mining)	-0.06	(Business)	0.22	0.05	18,439

Note: a. Industry wage premium refers to the ``The weighted average industry wage premium"

b. STD: $\mathrm{var}[\sum_{k=1}^{K} \hat{\beta}_k \cdot s_k] = \mathrm{var}[s'\hat{\beta}] = s'\mathrm{var}[\hat{\beta}]s$

c. Mining denotes the mining & quarrying and electricity, gas & water industries; Agriculture denotes the agricultures, forestry, fishing & livestock; Manufacture denotes the durables manufacture industry; Transport denotes the transport, storage & communication industries; Finance denotes the finance, insurance & real estate; Services denotes the community, social & personal services industries

Table 2 (a) : Estimation Results of Interindustry Gender Wage Gap for 1978 MUS								
	Various gender wage gap estimators by industry							
Ranked Industries	$\hat{g}_j^a$	**ranking**	$\hat{\delta}_j$	**ranking**	$\hat{\gamma}_j$	$\hat{\phi}_j$	**ranking**	$\hat{\rho}_j^b$
Mining	-0.4427***	8	-0.4644***	8	0.3849***	-0.5537***	8	0.4367***
	(0.1494)		(0.0803)		(0.1386)	(0.0783)		(0.0811)
Agriculture	-0.0578	1	-0.0795	1	0.0000	-0.2908***	7	0.1737***
	(0.0556)		(0.1075)		(0.0000)	(0.0260)		(0.0336)
Manufacturing	-0.1218	3	-0.1434***	3	0.0640	-0.1366***	3	0.0196
	(0.1256)		(0.0120)		(0.1138)	(0.0094)		(0.0230)
Construction	-0.0917	2	-0.1134***	2	0.0339	-0.1334***	2	0.0164
	(0.1298)		(0.0346)		(0.1177)	(0.0325)		(0.0387)
Business	-0.1475	4	-0.1692***	4	0.0898	-0.117***	1	0.0000
	(0.1264)		(0.0252)		(0.1150)	(0.0216)		(0.0000)
Transport	-0.3147**	7	-0.3364***	7	0.2569**	-0.2582***	6	0.1412***
	(0.1307)		(0.0429)		(0.1196)	(0.0420)		(0.0461)
Finance	-0.2063	6	-0.228***	6	0.1485	-0.1695***	4	0.0525
	(0.1337)		(0.0496)		(0.1225)	(0.0481)		(0.0521)
Services	-0.1846	5	-0.2063***	5	0.1268	-0.2077***	5	0.0907***
	(0.1264)		(0.0247)		(0.1151)	(0.0224)		(0.0304)

Table 2 (b) : Estimation Results of Interindustry Gender Wage Gap for 1983 MUS								
	Various gender wage gap estimators by industry							
Ranked Industries	$\hat{g}_j^a$	**ranking**	$\hat{\delta}_j$	**ranking**	$\hat{\gamma}_j$	$\hat{\phi}_j$	**ranking**	$\hat{\rho}_j^b$
Mining	-0.3586*	8	-0.6824***	8	0.577***	-0.798***	8	0.6459***
	(0.1904)		(0.0737)		(0.0796)	(0.0727)		(0.0803)
Agriculture	0.0028	6	-0.3209**	6	0.2156	-0.2804***	7	0.1283***
	(0.0623)		(0.1603)		(0.1662)	(0.0358)		(0.0496)
Manufacturing	0.0860	3	-0.2377***	3	0.1324***	-0.2681***	6	0.116***
	(0.1754)		(0.0105)		(0.0327)	(0.0088)		(0.0352)
Construction	0.2184	1	-0.1053***	1	0.0000	-0.1729***	2	0.0208
	(0.1776)		(0.0319)		(0.0000)	(0.0303)		(0.0457)
Business	0.0556	4	-0.2681***	4	0.1628***	-0.1966***	3	0.0445
	(0.1755)		(0.0208)		(0.0380)	(0.0178)		(0.0383)
Transport	-0.0154	7	-0.3391***	7	0.2338***	-0.2664***	5	0.1143**
	(0.1791)		(0.0403)		(0.0511)	(0.0399)		(0.0518)
Finance	0.0874	2	-0.2363***	2	0.131***	-0.1521***	1	0.0000
	(0.1782)		(0.0358)		(0.0480)	(0.0345)		(0.0000)
Services	0.0480	5	-0.2757***	5	0.1704***	-0.2253***	4	0.0732*
	(0.1755)		(0.0212)		(0.0371)	(0.0193)		(0.0390)

Table 2 (c) : Estimation Results of Interindustry Gender Wage Gap for 1988 MUS								
	Various gender wage gap estimators by industry							
Ranked Industries	$\hat{g}_j^a$	ranking	$\hat{\delta}_j$	ranking	$\hat{\gamma}_j$	$\hat{\phi}_j$	ranking	$\hat{\rho}_j^b$
Mining	-0.1500	8	-0.3495**	8	0.1890	-0.3478**	7	0.2126
	(0.2021)		(0.1371)		(0.1394)	(0.1367)		(0.1394)
Agriculture	-0.0952*	5	-0.2946**	5	0.1341	-0.3525***	8	0.2173***
	(0.0514)		(0.1372)		(0.1429)	(0.0306)		(0.0413)
Manufacturing	-0.0901	4	-0.2895***	4	0.1291***	-0.3255***	6	0.1903***
	(0.1481)		(0.0093)		(0.0283)	(0.0073)		(0.0284)
Construction	0.0389	1	-0.1605***	1	0.0000	-0.1893***	3	0.0541
	(0.1502)		(0.0276)		(0.0000)	(0.0264)		(0.0381)
Business	-0.1157	6	-0.3151***	6	0.1546***	-0.2421***	4	0.1069***
	(0.1482)		(0.0168)		(0.0324)	(0.0144)		(0.0309)
Transport	-0.0417	3	-0.2412***	3	0.0807*	-0.1825***	2	0.0474
	(0.1521)		(0.0370)		(0.0457)	(0.0365)		(0.0452)
Finance	-0.0002	2	-0.1996***	2	0.0391	-0.1352***	1	0.0000
	(0.1501)		(0.0287)		(0.0397)	(0.0278)		(0.0000)
Services	-0.1435	7	-0.3429***	7	0.1824***	-0.2788***	5	0.1436***
	(0.1478)		(0.0179)		(0.0321)	(0.0166)		(0.0320)

Table 2 (d) : Estimation Results of Interindustry Gender Wage Gap for 1993 MUS								
	Various gender wage gap estimators by industry							
Ranked Industries	$\hat{g}_j^a$	ranking	$\hat{\delta}_j$	ranking	$\hat{\gamma}_j$	$\hat{\phi}_j$	ranking	$\hat{\rho}_j^b$
Mining	-0.1805	7	-0.467***	7	0.2741**	-0.4484***	8	0.2699**
	(0.1796)		(0.1183)		(0.1200)	(0.1183)		(0.1189)
Agriculture	-0.1967***	8	-0.4831***	8	0.2902**	-0.3749***	6	0.1965***
	(0.0565)		(0.1229)		(0.1263)	(0.0373)		(0.0397)
Manufacturing	-0.0362	5	-0.3226***	5	0.1297***	-0.3789***	7	0.2005***
	(0.1355)		(0.0104)		(0.0228)	(0.0082)		(0.0155)
Construction	0.0935	1	-0.1929***	1	0.0000	-0.2286***	4	0.0502**
	(0.1361)		(0.0214)		(0.0000)	(0.0198)		(0.0235)
Business	0.0493	2	-0.2371***	2	0.0442*	-0.1784***	1	0.0000
	(0.1354)		(0.0141)		(0.0255)	(0.0136)		(0.0000)
Transport	-0.0113	4	-0.2977***	4	0.1048***	-0.2264***	3	0.0479
	(0.1387)		(0.0317)		(0.0379)	(0.0319)		(0.0337)
Finance	0.0073	3	-0.2792***	3	0.0862***	-0.2237***	2	0.0453*
	(0.1365)		(0.0209)		(0.0298)	(0.0200)		(0.0236)
Services	-0.0395	6	-0.3259***	6	0.133***	-0.275***	5	0.0966***
	(0.1353)		(0.0157)		(0.0256)	(0.0154)		(0.0195)

Table 2 (e) : Estimation Results of Interindustry Gender Wage Gap for 1998 MUS								
Various gender wage gap estimators by industry								
Ranked Industries	$\hat{g}_j^a$	**ranking**	$\hat{\delta}_j$	**ranking**	$\hat{\gamma}_j$	$\hat{\phi}_j$	**ranking**	$\hat{\rho}_j^b$
Mining	-0.4038**	8	-0.6332***	8	0.4765***	-0.5927***	8	0.4776***
	(0.1707)		(0.1145)		(0.1157)	(0.1147)		(0.1157)
Agriculture	-0.2911***	7	-0.5205***	7	0.3638***	-0.3318***	7	0.2166***
	(0.0569)		(0.1152)		(0.1174)	(0.0420)		(0.0449)
Manufacturing	-0.0362	6	-0.2655***	6	0.1089***	-0.3180***	6	0.2029***
	(0.1276)		(0.0098)		(0.0201)	(0.0078)		(0.0177)
Construction	0.0384	2	-0.1909***	2	0.0343	-0.214***	5	0.0989***
	(0.1285)		(0.0217)		(0.0274)	(0.0200)		(0.0255)
Business	0.0206	3	-0.2088***	3	0.0521***	-0.1777***	3	0.0625***
	(0.1275)		(0.0122)		(0.0201)	(0.0123)		(0.0198)
Transport	-0.0007	5	-0.2300***	5	0.0734**	-0.1697***	2	0.0546*
	(0.1302)		(0.0270)		(0.0315)	(0.0274)		(0.0314)
Finance	0.0727	1	-0.1567***	1	0.0000	-0.1151***	1	0.0000
	(0.1285)		(0.0170)		(0.0000)	(0.0161)		(0.0000)
Services	0.0080	4	-0.2213***	4	0.0647***	-0.1817***	4	0.0666***
	(0.1276)		(0.0136)		(0.0208)	(0.0134)		(0.0206)

Table 2 (f) : Estimation Results of Interindustry Gender Wage Gap for 2003 MUS								
Various gender wage gap estimators by industry								
Ranked Industries	$\hat{g}_j^a$	**ranking**	$\hat{\delta}_j$	**ranking**	$\hat{\gamma}_j$	$\hat{\phi}_j$	**ranking**	$\hat{\rho}_j^b$
Mining	-0.0273	7	-0.3234**	7	0.1780	-0.2567*	6	0.1470
	(0.1925)		(0.1510)		(0.1518)	(0.1510)		(0.1518)
Agriculture	-0.0620	8	-0.3581***	8	0.2126**	-0.2813***	8	0.1715***
	(0.0578)		(0.1052)		(0.1076)	(0.0406)		(0.0437)
Manufacturing	0.0880	6	-0.2081***	6	0.0626***	-0.2693***	7	0.1595***
	(0.1196)		(0.0106)		(0.0203)	(0.0082)		(0.0179)
Construction	0.1388	2	-0.1573***	2	0.0119	-0.169***	5	0.0593*
	(0.1212)		(0.0271)		(0.0318)	(0.0260)		(0.0304)
Business	0.1069	5	-0.1892***	5	0.0438**	-0.153***	4	0.0433**
	(0.1194)		(0.0120)		(0.0204)	(0.0121)		(0.0197)
Transport	0.1210	3	-0.1751***	3	0.0297	-0.145***	2	0.0353
	(0.1222)		(0.0268)		(0.0314)	(0.0272)		(0.0312)
Finance	0.1507	1	-0.1454***	1	0.0000	-0.1097***	1	0.0000
	(0.1206)		(0.0172)		(0.0000)	(0.0162)		(0.0000)
Services	0.1093	4	-0.1868***	4	0.0414**	-0.1501***	3	0.0404**
	(0.1197)		(0.0130)		(0.0206)	(0.0127)		(0.0203)

[a] Note that $\hat{g}_j$, $\hat{\delta}_j$, and $\hat{\gamma}_j$ are directly reproduced from Table 2 and Table 3 in Horrace and Oaxaca (2001). The left-out reference group in $\hat{g}_j$ is Mining. $\hat{\phi}_j$ and $\hat{\rho}_j$ are adopted and sorted from Table 4 in Horrace and Oaxaca (2001) since the ranked industries for the two measures are different from those for other measures.

[b] According to Horrace and Oaxaca (2001), $\hat{\rho}_j = \max_{n=1...J} \hat{\phi}_n - \hat{\phi}_j$.

[c] Standard errors are in the parentheses.

* denoteds statistically significant at 10% significance level.

** denoteds statistically significant at 5% significance level.

*** denoteds statistically significant at 2.5% significance level.

Mining denotes the mining and quarrying and electricity, gas and water industries ; Agriculture denotes the agricultures, forestry, fishing and livestock ; Manufacture denotes the durables manufacture industry; Transport denotes the transport, storage and communication industries; Finance denotes the finance, insurance and real estate ; Services denotes the community, social & personal services industries

Table 3: Summary Results of Interindustry of Gender Wage Gap

Year	Ranking Measurement	Highest Ranking		Lowest Ranking		Range
1978	$\hat{\delta}_j$	-0.08	(Agriculture)	-0.46	(Mining)	0.38
	$\hat{\phi}_j$	-0.12	(Business)	-0.55	(Mining)	0.44
1979	$\hat{\delta}_j$	-0.08	(Construction)	-0.42	(Mining)	0.35
	$\hat{\phi}_j$	-0.11	(Finance)	-0.55	(Mining)	0.44
1980	$\hat{\delta}_j$	-0.14	(Construction)	-0.81	(Mining)	0.67
	$\hat{\phi}_j$	-0.13	(Services)	-0.93	(Mining)	0.80
1981	$\hat{\delta}_j$	-0.15	(Construction)	-0.59	(Mining)	0.44
	$\hat{\phi}_j$	-0.17	(Services)	-0.65	(Mining)	0.47
1982	$\hat{\delta}_j$	-0.15	(Construction)	-0.71	(Mining)	0.55
	$\hat{\phi}_j$	-0.14	(Finance)	-0.83	(Mining)	0.69
1983	$\hat{\delta}_j$	-0.11	(Construction)	-0.68	(Mining)	0.58
	$\hat{\phi}_j$	-0.15	(Finance)	-0.80	(Mining)	0.65
1984	$\hat{\delta}_j$	-0.20	(Construction)	-0.39	(Mining)	0.20
	$\hat{\phi}_j$	-0.18	(Finance)	-0.56	(Mining)	0.38
1985	$\hat{\delta}_j$	-0.18	(Construction)	-0.41	(Mining)	0.22
	$\hat{\phi}_j$	-0.16	(Finance)	-0.46	(Mining)	0.30
1986	$\hat{\delta}_j$	-0.20	(Construction)	-0.48	(Mining)	0.27
	$\hat{\phi}_j$	-0.15	(Finance)	-0.50	(Mining)	0.36
1987	$\hat{\delta}_j$	-0.15	(Construction)	-0.68	(Mining)	0.53
	$\hat{\phi}_j$	-0.16	(Finance)	-0.68	(Mining)	0.52
1988	$\hat{\delta}_j$	-0.16	(Construction)	-0.35	(Mining)	0.19
	$\hat{\phi}_j$	-0.14	(Finance)	-0.35	(Agriculture)	0.22
1989	$\hat{\delta}_j$	-0.19	(Construction)	-0.72	(Mining)	0.53
	$\hat{\phi}_j$	-0.20	(Finance)	-0.70	(Mining)	0.50
1990	$\hat{\delta}_j$	-0.17	(Construction)	-0.59	(Mining)	0.41
	$\hat{\phi}_j$	-0.15	(Finance)	-0.58	(Mining)	0.43
1991	$\hat{\delta}_j$	-0.21	(Construction)	-0.52	(Mining)	0.31
	$\hat{\phi}_j$	-0.20	(Finance)	-0.47	(Mining)	0.28

Table 3: Summary Results of Interindustry of Gender Wage Gap (continued)

Year	Ranking Measurement	Highest Ranking		Lowest Ranking		Range
1992	$\hat{\delta}_j$	-0.10	(Agriculture)	-0.34	(Services)	0.25
	$\hat{\phi}_j$	-0.07	(Mining)	-0.44	(Agriculture)	0.37
1993	$\hat{\delta}_j$	-0.19	(Construction)	-0.48	(Agriculture)	0.29
	$\hat{\phi}_j$	-0.18	(Business)	-0.45	(Mining)	0.27
1994	$\hat{\delta}_j$	-0.17	(Construction)	-0.59	(Mining)	0.42
	$\hat{\phi}_j$	-0.19	(Business)	-0.67	(Mining)	0.49
1995	$\hat{\delta}_j$	-0.02	(Mining)	-0.30	(Manufacture)	0.29
	$\hat{\phi}_j$	-0.15	(Mining)	-0.36	(Manufacture)	0.22
1996	$\hat{\delta}_j$	-0.20	(Construction)	-0.63	(Mining)	0.42
	$\hat{\phi}_j$	-0.15	(Finance)	-0.51	(Mining)	0.35
1997	$\hat{\delta}_j$	-0.17	(Construction)	-0.57	(Mining)	0.40
	$\hat{\phi}_j$	-0.16	(Finance)	-0.59	(Mining)	0.43
1998	$\hat{\delta}_j$	-0.16	(Finance)	-0.63	(Mining)	0.48
	$\hat{\phi}_j$	-0.12	(Finance)	-0.59	(Mining)	0.48
1999	$\hat{\delta}_j$	-0.13	(Finance)	-0.29	(Mining)	0.15
	$\hat{\phi}_j$	-0.10	(Finance)	-0.30	(Manufacture)	0.21
2000	$\hat{\delta}_j$	-0.13	(Finance)	-0.31	(Agriculture)	0.17
	$\hat{\phi}_j$	-0.09	(Finance)	-0.32	(Manufacture)	0.24
2001	$\hat{\delta}_j$	-0.14	(Finance)	-0.37	(Agriculture)	0.22
	$\hat{\phi}_j$	-0.11	(Finance)	-0.28	(Manufacture)	0.17
2002	$\hat{\delta}_j$	-0.14	(Finance)	-0.23	(Mining)	0.09
	$\hat{\phi}_j$	-0.12	(Finance)	-0.28	(Manufacture)	0.16
2003	$\hat{\delta}_j$	-0.15	(Finance)	-0.36	(Agriculture)	0.21
	$\hat{\phi}_j$	-0.11	(Finance)	-0.28	(Agriculture)	0.17

Mining denotes the mining & quarrying and electricity, gas and water industries ; Agriculture denotes the agricultures, forestry, fishing and livestock ; Manufacture denotes the durables manufacture industry; Transport denotes the transport, storage and communication industries; Finance denotes the finance, insurance and real estate ; Services denotes the community, social and personl services industries