Gender Wage Differentials among Disabled People : Evidence from South Korea

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Abstract

Empirical analysis for the comparison of gender differences among disabled people has been relatively neglected in the literature on discrimination. This paper using data from the 2008 PSED investigates gender wage differentials among the disabled in Korea. The selectivity corrected decomposition framework is employed to examine what factors - endowments, discrimination, and selectivity - account for the wage gap. The main results presented in this paper are as follows: First, the gender wage gap among the disabled is sizable. Second, the wage gap is significantly attributable to discrimination. Moreover, disabled female workers also suffer a substantial wage penalty in terms of the portion of their wages attributable to discrimination. Third, the endowments factor plays an important role in explaining gender wage differentials as well. Finally, the presence of selection effects raises the observed wage gap. Such evidence suggests that Korean disabled female workers are more likely to be disadvantaged than their male counterparts in terms of wages. Thus, national policies, regulations or laws against gender discrimination (e.g., the U.K. DDA 1995, the U.S. ADA of 1990) and additional supports beyond prohibiting discrimination (e.g., vocational training, on-the-job training) are needed to enhance the labor market status of disabled female workers in Korea.

Key words

Disability, discrimination, gender, wage differentials, Korea

Introduction

Discrimination occurs when individuals or groups are treated unfairly when compared to similarly situated individuals or groups because of personal characteristics such as race, color, religion, gender, or disability. The 2009 U.S. State Department report on human rights notes that South Korea (hereafter denoted as Korea) generally respects the human rights of its citizens; however, women, persons with disabilities, and minorities continued to face societal discrimination due to traditional attitudes that limit opportunities for women, persons with disabilities, and ethnic minorities. This report suggests that Korean women with disabilities may be experiencing "double discrimination," being female as well as disabled. In that sense, disabled female workers could be considered a special concern in the Korean labor market.

Feminist disability scholars have begun to conceptualize the relationship between sexism and "disablism" of women with disabilities as "double discrimination" while discussing the overlap in personal and political issues for disabled females (e.g., Fine & Asch, 1988; Lonsdale, 1990; Morris, 1996). Based on the assumption that disability is always inextricably linked to other social markers, such as gender, race, and social class, they have shown that women with disabilities experience a dual form of discrimination with respect to both gender and disability. That is, the results suggest that disabled female workers may be treated less favorably than not only their non-disabled female counterparts but also their male counterparts in the labor market when "double discrimination" based on both gender and disability occurs. Despite the progress made over the last three decades in this area, most previous studies on the status of disabled females with respect to "double discrimination" have been mainly focused in terms of social welfare administration/ policy without economic perspectives (Priestley, 2003). It may in part reflect that the research in this area has not extended economic analysis to examine labor market consequences experienced by disabled female workers.

In the mean time, the dual form of discrimination against disabled females (i.e., disability and gender) has traditionally been addressed separately in the economic literature. Regarding disability issues, in particular, numerous studies have examined the impact of disability status by com-

paring labor market outcomes between the disabled and the non-disabled with increasing attention. For instance, the U.K. and the U.S. have experienced a substantial increase in publication on such issues since the U.K. Disability Discrimination Act 1995 (DDA) and the U.S. Americans with Disability Act of 1990 (ADA) respectively (e.g., Baldwin, Johnson, & Watson, 1995, 2000; DeLeire, 2001; Jones, Latreille, & Sloane, 2006; Kidd, Sloane, & Ferko, 2000).

In contrast, there has been relatively little empirical research on gender issues of disabled females within the labor market. Indeed, the research on gender discrimination among the disabled has been relatively ignored in Korea, given gender differences in labor market outcomes among the disabled.[1] To my knowledge, the only economic analysis of wage discrimination against disabled female workers published in a journal to date in Korea is that by Jung (2010) which used data from the 2008 Panel Survey of Employment for the Disabled (hereafter denoted as PSED). Moreover, there has been relatively little policy interest in disabled female issues in Korea. This may in part reflect the situation that dealing with gender issues among disabled people has been almost overtaken by the gender mainstreaming approach. For instance, while the Korean government established the Ministry of Gender Equity in 2001 to ensure that gender perspective is introduced in all government policies and has made significant achievements in gender-related issues, they still have failed to implement a comprehensive strategy addressing discrimination against disabled females.

In the light of the results by Jung (2010), this paper using data from the 2008 PSED attempts to provide new empirical evidence on gender wage differentials among the disabled working population in Korea. The PSED dataset used in the present study is a unique Korean data set on individuals who are registered as disabled. This study in particular focuses on gender wage discrimination against disabled female workers. This is because the relative position of females in the labor market in general is inferior to that of males, at least in terms of wages, thus it

[1] The employment rate for the disabled females is just 23.7 percent, compared to the rate of 47.6 percent for the disabled males and disabled female workers earn on average approximately 56 percent less than their male counterparts, according to the 2008 National Survey on Persons with Disability in Korea, released in 2009.

is clearly of interest to ascertain whether disabled females are similarly disadvantaged relative to disabled males (e.g., Jones *et al.*, 2006).

As stated, disabled female workers may be experiencing "double discrimination," being female as wells as disabled. Since this paper focuses on gender discrimination among the disabled, it is difficult to understand in what ways disabled females experience the double aspect of the discrimination. Without this type of empirical analysis, however, one may be clearly aware of the fact that disabled females would have a lower wage rate than their non-disabled counterparts. And discrimination based on disability would play an important role in explaining the wage gap between disabled and non-disabled female workers.[2]

Jung (2010) claims that selection bias turns out to be empirically unimportant in her case because the inverse mills ratio term is not statistically significant. There are, however, some issues that need to be clarified with respect to this claim. First, the author does not mention exactly what selection is being examined. Presumably it is employed vs. not employed. In her case, does not employed mean unemployed or does it include those who are out of the labor force? Second, one does not know how the probit equation was specified. This should be made explicit and the results reported otherwise one cannot ascertain if there were any exclusion restriction problems.

To address the above deficiencies, this study incorporates the probability of employment into the analysis and the wage equations are corrected for selectivity using the Heckman procedure (i.e., the Heckman selection model). And subsequently the selectivity corrected decomposition approach suggested by Neuman and Oaxaca (2004) decomposes gender wage differentials in mean observed wages into 'endowments' (a part attributed to differences in productivity), 'discrimination' (a part attributed to gender discrimination), and 'selectivity' (a part attributed to selection bias) components.

There are several contributions made by this new analysis. First, this paper advances the literature on gender wage discrimination against dis-

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[2] One may want to understand "to what extent" gender discrimination of the disabled is different from those of the non-disabled. This paper presents comparisons of gender discrimination of the disabled and the non-disabled by reviewing literature surveys that are already published in the Results and Discussion section.

abled female workers in Korea, by considering decompositions with selectivity correction. If selection effects have significant implications in the form of gender wage discrimination, this paper determines whether such economic consequences exist. Second, the PSED used in this study is a unique dataset aimed at addressing the economic activities of a sample of respondents with disabilities. Accordingly this survey provides an opportunity for researchers not to concern about justification bias in terms of defining disability and thus has an advantage over researcher defined disability. In other words, the disability classifications in this study are superior to other studies at least in that the PSED survey adopts some definition of disability to identify disabled people from the population and researchers do not need to craft their own definitions to apply to a general sample of the population. Since there are no socially or conventionally acceptable measures of disability, many previous studies in the literature on discrimination have their own subjective criteria to identify disabled people in the survey. Finally, this study contributes to future research investigating many other disabled female-related labor market issues such as employment participation. In particular there has been relatively little empirical work on the labor market status of disabled females in Korea, though the literature on the labor market discrimination has grown in the last 10 years. This paper and future research will narrow this gap.

The main results presented in this study are as follows. First, the wage gap between disabled male and female workers is sizable at 43 percent. Second, the gender wage gap among the disabled is significantly associated with discrimination (49-66 percent). Moreover, disabled female workers also suffer a substantial wage penalty in terms of the portion of their wages attributable to discrimination (25-31 percent). Third, the endowment factor plays an important role in explaining gender wage differentials as well (34-51 percent). Finally, the presence of selection effects raises the observed gender wage gap among the disabled in this analysis. In addition, the estimated discrimination and endowment components can vary based on assumptions about how or whether to incorporate selection effects. The allocation of all selection effects yields similar or lower estimates of discrimination in general, but raises the estimate of endowments. Even a partial allocation of selection effects raises (lowers) the estimate of discrimination (endowments) respectively.

Such evidence suggests that Korean disabled female workers are more likely to be disadvantaged than their male counterparts in terms of wages. Thus, national policies, regulations or laws against gender discrimination (e.g., the U.K. Disability Discrimination Act 1995 (DDA), the U.S. Americans with Disabilities Act of 1990 (ADA)) and additional supports beyond prohibiting discrimination (e.g., vocational training, on-the-job training) are needed to enhance the labor market status of disabled female workers in Korea.

Methodology

Selection Issues on Estimating Wage Equations

When examining the disabled working population, there would be a strong presumption that selection effects are at work with respect to labor force participation. Under such circumstances, a simple ordinary least squares (OLS) model is expected to provide biased estimates of wage equations. This is because wages are usually estimated from a censored sample that includes only employed disabled workers, i.e., the observed wages. The present study thus employs the Heckman's two-step procedure (hereafter denoted as Heckman model) to correct sample selection bias caused by the absence of information on offer wages to non-workers. In the first stage, consider the traditional reduced form labor force participation equation (selection equation) in given by

$$E_{i,j}^{*} = \gamma_j Z_{i,j} + \mu_{i,j} \quad (j = m \text{ or } f) \tag{1}$$

where $E_{i,j}^{*}$ is a latent index that can be thought of as representing the difference between the employer's wage offer and his or her reservation wage.[3] $Z_{i,j}$ is a vector of observed variables determining labor force participation such as conventional human capital variables. Only an indicator variable for employment is observed, defined as $E=1$ if $E_i^{*}>0$ and $E=0$ otherwise.[4]

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[3] The 'offered wage' is defined as the maximum wage rate at which an employer is willing to pay a worker. And the 'reservation wage' is defined as the minimum wage rate at which an individual will accept employment.

In the second stage, the wage equation (outcome equation) is

$$lnW_{i,j} = \beta_j X_{i,j} + \mu_{i,j} \quad (j = m \text{ or } f) \tag{2}$$

where $lnW_{i,j}$ is the log of hourly (offer) wage of the individual worker i, m and f denote disabled males and females respectively, $X_{i,j}$ is a vector of observed variables related to productivity characteristics, β_j is the returns on characteristics, and $\mu_{i,j}$ includes all unobserved determinants of wages. The wage equation (2) assumes that W is observed only for employed workers. That is, W is observed if the individual accepts employment in case the employer's offered wage exceeds their reservation wage, i.e., $E=1$.

The probit estimates of γ_j from the employment equation (1) are used to construct consistent estimates of the inverse Mills ratio term ($\lambda_{i,j}$, hereafter denoted as *IMR*) that is used as an additional regressor to correct for selection bias in the wage equation (2), which is

$$lnW^*_{i,j} = \beta_j X_{i,j} + \theta_j \lambda_{i,j} + \mu_{i,j} \quad (j = m \text{ or } f) \tag{3}$$

where $lnW^*_{i,j}$ is the log hourly wage of the individual worker i and the variable $\lambda_{i,j}$ is the bias correction term/ selectivity variable created to account for selection bias in the sample wage respondents. The wage equation (3) is estimated by ordinary least squares (OLS) in the second stage. The second step is carried out only for the uncensored observations and provides consistent and asymptotically normal estimators for β_j and θ_j.

Identification Issues

In the first stage of the Heckman model (the employment equation), the dependent variable is a dummy indicating whether or not the dis-

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[4] The employment variable (E) takes the value 1 if the disabled individual participates in the labor force ('labor force participation') and 0 if the disabled individual is not in the labor force ('not participating'). The reference group ('not participating') includes potential workers who choose not to seek employment, and so are counted as 'out of the labor force' in official employment statistics.

abled individual participates in the labor force. And the estimates of the probit model are used to construct the *IMR* for the selectivity corrected wage equations in the second stage of Heckman model (the wage equation). Then the gender wage gap from the selectivity corrected wage equations are decomposed into three components: endowments, discrimination, and selectivity.[5]

In the present paper, two dummy variables indicating the presence of other labor market income earner (*OEARNER*) and dependent children under the age of 18 (*CHILD*) in the household are incorporated as exclusion restrictions for identification. Stated another way, identification is obtained by including these two dummy variables in the employment equation and excluding them from the wage equation. This is based on the following assumption that for disabled individuals those two excluded variables sometimes called instrumental variables (IV) contribute to determining the propensity to employment but are not related to wages.[6]

In addition to this, like many previous studies in this area, age and its square are also appeared in the selection equations, but potential labor market experience and its square are in the wage equations (e.g., Jones *et al.*, 2006; Neuman & Oaxaca, 2005). Clearly labor market char-

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[5] The employment equation includes: age and age squared, marital status, region, severity of disability, educational attainment, other labor market income earner in the household, and the presence of dependent children under the age of 18. The wage determination equations follow the Mincerian type wage specification. The log of hourly wages is regressed against a linear combination of socio-demographical characteristics, conventional human capital variables, and labor market characteristics. The wage equation includes: marital status, region, severity of disability, (maximum) potential labor market experience and experience squared, educational attainment, labor union membership, part-time employment contract, public-sector employment, occupation, and industry with addition of *IMR*.

[6] It seems reasonable to assume that the factors influencing the value of time (e.g., presence of children, exogenous income, nonwage income, etc.) play an important role in determining whether individuals participate in the labor force or not, but do not directly affect the wages of workers. Some previous studies, in particular, use a dependent children dummy and a dummy indicating the presence of other labor market income earner in the household as exclusion restrictions (e.g., Heckman, Lyons, & Todd, 2000; Jones *et al.*, 2006). For instance, Jones *et al.* (2006) find the evidence that for disabled individuals the presence of other labor market income earner in the household discourages employment participation. They also claim that disabled males (females) with dependent children under age 18 are more (less) likely to be employed that their counterparts without dependent children respectively.

acteristic variables in the wage equation are not observed in the employment equations, since such information is not available for individuals who are not employed. As Jones (2006) note that this could influence the correction for selectivity bias in the equations. Additionally, the sample selectivity variable (*IMR*) is also excluded from the employment equations.

Decomposing Gender Wage Differentials

The standard wage decomposition methodology by Blinder (1973) and Oaxaca (1973) is widely used in the literature to examine gender discrimination in the labor market. It decomposes gender wage differentials into 'explained' and 'unexplained' components. The latter (former) is conventionally interpreted as a discrimination (human capital) portion respectively. The standard decomposition approach, however, ignores the presence of sample selection in the stage of decomposing wage differentials (e.g., Baldwin, Butler, & Johnson, 2001; Baldwin *et al.*, 1995, 2000; Kidd *et al.*, 2000; Jones *et al.*, 2006; Jung, 2010). The present study thus adopts the selectivity corrected decompositions approach suggested by Neuman and Oaxaca (2004) to consider selectivity bias in estimating a part of wage differentials attributed to discrimination. This methodological framework can be applicable under the condition when the bias correction term is included in the wage equation, i.e., the decomposition extension of Heckman model.

In this paper, the selectivity corrected decomposition methodology decomposes gender wage differentials among the disabled into three components: 'endowments,' 'discrimination,' and 'selectivity.' The 'endowments' component represents a part of the difference attributable to productivity-related characteristics. The 'discrimination' component is the 'unexplained' residual that is traditionally defined as a discrimination portion.[7] The 'selectivity' component measures the contribution of se-

[7] It is a pure measure of discrimination only if the productivity-related characteristics fully capture all productivity differences. This study, however, refers to the 'unexplained' differential as discrimination, like conventional studies in this area. In addition, the estimated 'unexplained' gap could be an underestimate as well as an overestimates of discrimination. This is because any omitted variable bias depends on the correlations between the omitted and the included variables (Oaxaca & Ransom, 2003). That is, what I call 'discrimination'

lection effects to the observed wage differential. This technique allows policy-makers to identify the relative importance of differences of different factors that contribute to the observed gender wage gap and to develop a more effective approach for eliminating gender wage discrimination against disabled female workers.

In estimating the contributions of the three components in gender wage differentials, selectivity corrected wage equations (equation (3)) yield the following decomposition in assuming that the *m* (male) wage structure is the norm as the nondiscriminatory, like much of the literature:

$$\overline{W}_m - \overline{W}_f = \underbrace{\bar{X}'_f(\hat{\beta}_m - \hat{\beta}_f)}_{\text{Discrimination}} + \underbrace{(\bar{X}_m - \bar{X}_f)'\hat{\beta}_m}_{\text{Endowments}} + \underbrace{(\hat{\theta}_m\hat{\lambda}_m - \hat{\theta}_f\hat{\lambda}_f)}_{\text{Selectivity}} \tag{4}$$

This approach is implied to identify the overall selection component as a category apart from discrimination and endowments effects. The decomposition defined by equation (4) is labeled as 'decomposition #1.' In the case in which policy makers are primarily interested in direct pay equity, decomposition #1 would provide relevant target adjustment. This is because decomposition #1 offers policy implications regarding the elimination of wage discrimination against employed disabled females. In decomposition #1, the only term that is explicitly associated with labor market inequality is the first term that reflects gender differences in the returns to the observable characteristics (Neuman & Oaxaca, 2005).

As noted by Neuman and Oaxaca (2004), if one believes that gender differences in the probit selection parameter for employment represent discrimination and that gender differences in personal attributes that determine the probability of employment are simply endowment differences, the resulting decomposition would be:

$$\overline{W}_m - \overline{W}_f = \underbrace{\bar{X}'_f(\hat{\beta}_m - \hat{\beta}_f) + \hat{\theta}_m(\hat{\lambda}^o_f - \hat{\lambda}_f)}_{\text{Discrimination}} + \underbrace{(\bar{X}_m - \bar{X}_f)\hat{\beta}_m + \hat{\theta}_m(\hat{\lambda}_m - \hat{\lambda}^o_f)}_{\text{Endowments}} + \underbrace{(\hat{\theta}_m - \hat{\theta}_f)\hat{\lambda}_f}_{\text{Selectivity}} \tag{5}$$

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in this paper is just a part of non-observable items. More generally, one has to be careful about arguing that the estimated 'unexplained' gap is a biased estimate of discrimination due to omitted variable bias. In general, the same set of variables belongs in both wage equations. So if one uses the standard set of variables that are used in wage regressions a la Mincer, and one believes there is omitted variable bias, then the Mincerian type wage specification is flawed for (disabled) males as wells as (disabled) females.

where $\widehat{\lambda_f^o}$ is the mean value of the *IMR* if disabled females faced the same selection equation that disabled males face. The decomposition defined by equation (5) is labeled as 'decomposition #2.' Decomposition #2 indicates that antidiscrimination policy would entail the elimination of the hiring discrimination against disabled females seeking employment in addition to the elimination of wage discrimination against already employed disabled female workers (Neuman & Oaxaca, 2005).

An alternative would be to regard gender differences in the wage effects of selectivity as one contribution to the endowments component:

$$\overline{W}_m - \overline{W}_f = \underbrace{\bar{X}'_f(\hat{\beta}_m - \hat{\beta}_f) + \hat{\theta}_m(\hat{\lambda}_f^o - \hat{\lambda}_f)}_{\text{Discrimination}} + \underbrace{(\bar{X}_m - \bar{X}_f)'\hat{\beta}_m + \hat{\theta}_m(\hat{\lambda}_m - \hat{\lambda}_f^o) + (\hat{\theta}_m - \hat{\theta}_f)\hat{\lambda}_f}_{\text{Endowments}} \quad (6)$$

The decomposition defined by equation (6) is labeled as 'decomposition #3.' The policy implications for decomposition #3 are the same as for decomposition #2. Finally, the most encompassing view of discrimination is:

$$\overline{W}_m - \overline{W}_f = \underbrace{\bar{X}'_f(\hat{\beta}_m - \hat{\beta}_f) + \hat{\theta}_m\hat{\lambda}_f^o - \hat{\theta}_f\hat{\lambda}_f}_{\text{Discrimination}} + \underbrace{(\bar{X}_m - \bar{X}_f)'\hat{\beta}_m + \hat{\theta}_m(\hat{\lambda}_m - \hat{\lambda}_f^o)}_{\text{Endowments}} \quad (7)$$

The decomposition defined by equation (7) is labeled as 'decomposition #4.' Although decomposition #4 is the most inclusive of the decompositions as far as measuring discrimination is concerned, it would not necessarily yield the largest estimate of discrimination. As Neuman and Oaxaca (2004) note that decomposition #1 is noncommittal regarding the role of selection effects in labor market discrimination and the decomposition expressed in (5), (6), and (7) involve varying degrees of assignment of selection effect decompositions to discrimination and endowment components.

The Concept of Labor Market Discrimination[8]

Altonji and Blank (1999) define labor market discrimination as a situation in which persons who provide labor market services and who are

[8] The primary reference for this section is Altonji & Blank (1999).

equally productive in a physical or material sense are treated unequally in a way that is related to an observable characteristic such as race, ethnicity, or gender. By "unequal" they mean these persons receive different wages or face different demands for their services at a given wage. Let the wage Y equal

$$Y = X\beta + \alpha Z + e$$

where X is a vector of exogenous productivity characteristics that are observable by firms, β is the vector of related coefficients, and Z is an indicator variable for membership in a minority group. Assuming that $X\beta$ fully captures the set of productive characteristics and their returns and/or Z is uncorrelated with e, then discrimination is a case where $\alpha < 0$.

As Cain (1986) discusses in some detail, there are difficulties just using this simple definition of "equally productive." First, 'productivity' may directly depend on Z. For instance, physical beauty may be rewarded in the entertainment industry. If customers prefer to watch white actresses or handsome newscasters, is this a legitimate component of productivity or sources of labor market discrimination against other racial groups or less handsome people? Second, there is also the issue of whether the production technology that determines β is truly exogenous. For instance, changes in technology in the fire fighting industry and in the military have altered the effects of physical strength on productivity and increased the average productivity of women relative to men. Finally, the X's could also be endogenous. That is, pre-labor market discrimination may reduce the productivity characteristics (the Xs) among the minority groups. For instance, discrimination in housing or in educational access among earlier generation may lower current education levels among minorities. And current labor market discrimination may also influence X. If minority groups believe that they will have difficulty being accepted in a particular profession, they are less likely to invest in the skills necessary for the profession.

Although such issues above may be hard to examine directly or whether or not these are relevant in this paper, it can still be the case that $\alpha < 0$ conditional on both X and β, which would constitute discrimination in the labor market. When measuring discrimination with decomposition techniques here, all that is being estimated is direct labor market

discrimination, though the size of the 'unexplained' (discrimination) differential identified in a decomposition analysis may be affected from the various other factors such as socio-cultural background, labor market structure, law, etc. That is, conditioning on the observed characteristics is there any wage differential attributed solely to gender. So differences in characteristics that are due to societal discrimination are not measured.[9]

Data

Panel Survey of Employment for the Disabled (PSED)

The Employment Development Institute (EDI) under the supervision of the Korea Employment Promotion Agency for the Disabled, an affiliate of the Ministry of Labor initiated the PSED in 2007 with the aim of addressing the economic activities of a selection of respondents with disabilities. The PSED is designed as a longitudinal survey of income activities of a representative sample of Korean households and individuals with disability. This dataset is a unique Korean dataset on individuals who are registered as disabled. The data source used in the present study is the 2008 PSED. The targets of the 2008 PSED survey are registered disabled persons who were selected in late 2007 for the PSED. This dataset consists of 5,092 registered disabled people and the sub group is designed to measure economic activity and employment characteristics of the disabled from the age of 15 to 75.

The PSED in general is highly useful for academic research and policy development for disabled people in Korea as it contains a rich variety of information focusing on registered disabled people. That is, this dataset can serve as a valuable data source for not only examining disability-related issues in research studies but also designing/ implementing the right set of disability-related labor policies and regulations. In research, the PSED dataset has a particular strength in that researchers at least do not need to have their own subjective definition of disability

[9] The major sources of labor market discrimination are as follows. Besides Becker taste driven discrimination on the part of employers, there could be fellow worker or consumer taste for discrimination (Becker, 1971). There could also be monopsony (Ransom & Oaxaca, 2010). There could be statistical discrimination as well (Phelps, 1972). For hierarchical discrimination see Baldwin *et al.* (2001).

to identify disabled individuals from survey data, unlike much of the literature on discrimination. Since there is no clear and widely accepted definition of disability, defining disability has been a fairly subjective issue in disability-related studies. To identify people with disabilities, some have drawn upon the distinction made by the World Health Organization (WHO) between disability, impairment and handicap. Others have used self-reported health status, work/ functional limitations, or specific impairments. It suggests that the results of studies (e.g., disability prevalence estimates) and their interpretation could be different depending on definitions by researchers.

Descriptive Statistics

The original 2008 PSED dataset used in this study is for 5,092 registered disabled people. The samples used for the probit (selectivity-corrected wage) estimation are 2,849 (805) males and 1,677 (277) females with 88.7 (21.3) percent of the original dataset respectively. I restrict the original dataset to salary workers from the age of 15 to 60, so self-employed and unpaid family-employed workers are not included in decomposition analysis. Table 1 presents the summary statistics (mean and standard deviation) of the variables used in the wage equations.

Most variables in Table 1 conform to usual predictions. Several important differences between disabled males and females are worthy of note. In panel *A*, disabled female workers typically earn less than their male counterparts, as would be expected. The log of hourly wages is 8.843 for disabled male workers and 8.414 for disabled female workers, yielding approximately 43 percent gender wage differentials. In other words, disabled female workers received, on average, nearly 43 percent lower wages than their male counterparts. It indicates that the relative position of disabled female workers may be inferior to that of disabled male workers in the Korean labor market, at least in terms of wages.

Table 1
Summary Statistics

Variables	Male	Female
Panel A: Dependent Variable		
LNHRW (The natural logarithm of hourly wages)	8.843 (0.027)	8.414 (0.041)
Panel B: Socio-demographic Characteristics		
AGE (Individual age; years)	46.355 (0.356)	47.379 (0.599)
AGESQ (The square of *AGE*/ 100)	22.510 (0.317)	23.439 (0.535)
MARRIED (Married individual)	0.821 (0.014)	0.895 (0.018)
RURAR (Rural region)	0.579 (0.017)	0.603 (0.029)
MILD (Mild disability)	0.752 (0.015)	0.751 (0.026)
Panel C: Human Capital Variables		
EXP (Potential labor market experience; years)	29.106 (0.393)	30.863 (0.678)
EXPSQ (The square of *EXP*/ 100)	9.714 (0.218)	10.795 (0.379)
HSDROP (Less than a high school diploma)	0.442 (0.018)	0.610 (0.029)
HSCHOOL (High school graduates)	0.399 (0.017)	0.300 (0.028)
COLLEGE (2-year college degree or above)	0.147 (0.012)	0.083 (0.017)
TENURE (Job tenure; years)	7.625 (0.304)	3.960 (0.274)
Panel D: Labor Market Characteristics		
UNION (Labor union Membership)	0.097 (0.010)	0.036 (0.011)
PART (Part-time employment contract)	0.130 (0.012)	0.224 (0.025)
PUBLIC (Public sector employment)	0.082 (0.010)	0.112 (0.019)
OCC1 (Managerial, senior official, or professional occupation)	0.047 (0.007)	0.004 (0.004)
OCC2 (Clerical, administrative, or secretarial occupation)	0.099 (0.011)	0.116 (0.019)
OCC3 (Services, sales, or customer services occupation)	0.106 (0.011)	0.195 (0.024)
OCC4 (Associated professional or technical occupation)	0.058 (0.008)	0.029 (0.010)
OCC5 (Process, plant, or operative occupation)	0.251 (0.015)	0.058 (0.014)
OCC6 (Laborer)	0.437 (0.017)	0.596 (0.030)
IND1 (Primary industry)	0.021 (0.005)	0.047 (0.013)
IND2 (Secondary industry)	0.443 (0.018)	0.264 (0.027)
IND3 (Tertiary industry)	0.534 (0.018)	0.690 (0.028)
Panel E: Other Variables		
OEARNER (Other labor market income earner)	0.473 (0.017)	0.516 (0.030)
CHILD (Dependent children under the age of 18)	0.535 (0.013)	0.458 (0.027)
Sample Size (Observations)	805	277

Note. Standard errors in parentheses

In addition to this, the results presented in panel *D* once again suggest that for disabled individuals gender differences in labor market characteristics could in part be associated with a gender wage differential in Korea. Specifically, disabled female workers are less likely to be union members (3.6 percent vs. 9.7 percent), more likely to work part-time (22.4 percent vs. 13 percent), and more likely to be employed in the public sector (11.2

percent vs. 8.2 percent) than their male counterparts, which could be one possible explanation for their lower wage levels. Moreover, disabled females are more likely to be employed in relatively low-wage occupations where the majority of workers make lower wages than their male counterparts. For instance, the employment rate in laborer occupations (managerial, senior official, or professional occupations) for disabled female workers is 59.6 percent (4.7 percent), compared to 43.7 percent (0.4 percent) for disabled male workers respectively. Such findings indicate that disabled female workers may be disadvantaged relative to disabled male workers in the Korean labor market.

Results and Discussion

Probit Estimates of the Employment Equation

The employment function based on the equation (1) provides information on the relationship between employment probability and observed variables influencing a worker's employment participation decision. Table 2 reports the probit estimates of the employment equation by gender. The gender specific probit estimates are presented in column (2) for disabled males and column (3) for disabled females respectively. In columns (2), all variables show statistically significant effects on employment participation of disabled males. For disabled females most findings also show statistically significant employment effects in column (3), except three variables – marital status (*MARRIED*), rural region (*RURAL*), and less than high school graduates (*HSDROP*). The signs of all coefficients, however, are still consistent with usual predictions in column (3).

Regarding hypothesis testing of coefficients, obviously the likelihood ratio test rejects the null hypothesis that all coefficients in each regression are jointly statistically insignificant (all slope coefficients are zero) at all conventional significance levels in both male and female categories. On the whole, in addition, the coefficient estimates shows different qualitative effects on the employment probability for disabled males and females. Indeed, the test rejects the null hypothesis of parameter homogeneity (equality) among gender groups of the disabled, as would be expected.

Table 2
Probit Estimates of Employment Participation

Variables (1)	Male (2)	Female (3)
Panel A: Socio-demographic Characteristics		
AGE (Individual age; years)	0.043 (0.016)***	0.069 (0.026)***
AGESQ (The square of *AGE*/ 100)	-0.081 (0.017)***	-0.097 (0.027)***
MARRIED (Married individual)	0.513 (0.085)***	0.194 (0.149)
RURAR (Rural region)	-0.206 (0.054)***	-0.036 (0.078)
MILD (Mild disability)	0.705 (0.053)***	0.678 (0.081)***
Panel B: Human Capital Variables		
HSDROP (Less than a high school diploma)	-0.118 (0.056)**	-0.111 (0.089)
COLLEGE (2-year college degree or above)	0.159 (0.094)*	0.414 (0.170)**
Panel C: Other Variables		
OEARNER (Other labor market income earner)	0.145 (0.055)***	0.336 (0.082)***
CHILD (Dependent children under the age of 18)	0.561 (0.074)***	-0.325 (0.080)***
Constant	-1.112 (0.348)***	-2.265 (0.057)***
Sample Size (Observations)	2849	1677
Log Likelihood	-1618	-766.4
χ^2 p-value	0.000	0.000
Pseudo R-squared	0.169	0.099

Note. Data are unweighted. Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1
Note. The χ^2 statistic is a test that all slope coefficients are zero.
Note. Pseudo-R^2 is McFadden's measure (1974), defined as 1- the ratio of the maximized log-likelihood from the regression to that a regression including the optimal constant only.

Turning to the specific coefficient estimates, most findings are in accordance with the usual expectations. Begin with the socio-demographic characteristics in panel *A*. There are strong age effects, with positive and negative signs on the linear (*AGE*) and quadratic terms (*AGESQ*) respectively for both male and female categories. For disabled males being married (living in rural areas; *RURAL*) has a statistically significant positive (negative) effect on employment participation, but has no statistically significant effect on disabled females respectively. The estimates for the dummy variables of marital status (*MARRIED*) reflect conventional household roles. Regarding severity of disability, for both disabled males and females mild disability individuals (*MILD*) are more likely to be employed than their severe disability counterparts. Such findings are once again in accordance with the results found in numerous previous studies. For instance, Rigg (2005) shows that the employment rate is lower for more-severely disabled individuals, compared to less-severely disabled people.

In terms of educational attainment in panel *B*, both disabled males and females with relatively high educational qualifications (e.g., more

than a 2-year college degree; *COLLEGE*) are more likely to be employed than those with relatively low educational qualifications (e.g., high school diploma; the omitted group), while relatively low educational attainment (e.g., less than a high school diploma; *HSDROP*) reduces the likelihood of employment for both male and female cases of the disabled, as would be expected. For disabled females, in particular, the marginal effect of higher education on employment participation (*COLLEGE*) is stronger than that of their male counterparts. It suggests that for disabled females education may be a particularly important factor for higher employment in Korea.

In panel *C*, for both disabled males and females the presence of other labor market income earner in the household (*OEARNER*) has a positive employment effect. And disabled males (females) with dependent children under the age of 18 (*CHILD*) are more (less) likely to be employed that their counterparts without dependent children respectively. Such findings also confirm the results of previous studies in this area (e.g., Heckman *et al.*, 2000; Jones *et al.*, 2006).

Selectivity Correlated Estimates of the Wage Equation

In Table 3, the selectivity corrected estimates based on the wage equation (3) are presented in column (2) for disabled males and column (3) for disabled females respectively. Most variables have statistically significant effects in the wage equations for disabled males, while a relatively small number of coefficient estimates are statistically significant in the model for disabled females. For disabled females the lack of statistical significance may in part be explained by the relatively small number of observations, however all findings have the same signs with the results for disabled males.

In terms of the specific coefficient estimates, these are once again in accordance with usual predictions based on the traditional labor market analysis. As regards the socio-demographic characteristics in panel *A*, the marital status variable agrees with what most studies seem to show: being married (*MARRIED*) has positive returns for men and generally has little or no effect for women. As might be expected, the regional dummy shows that given the omitted category (urban region), living in rural areas (*RURAL*) is associated with lower wages for both disabled

male and female categories, though there is no statistically significant impact for disabled males. For both disabled males and females mild disability (*MILD*) is also positively related to wages.

Regarding human capital characteristics in panel *B*, there is a positive wage effect of potential labor market experience (*EXP*), though this effect is not statistically significant for disabled females. It indicates that potential labor market experience has no effect on higher wages for disabled females. For both disabled male and female workers higher education and job tenure (years in the current job) are generally associated with higher wages. Such findings are in accordance with the usual predictions in that disabled people with higher levels of human capital accumulation are paid more than those with lower levels of human capital traits. In particular, the presence of more than a 2-year college degree (*COLLEGE*) has a strong positive effect on wages: disabled male (female) workers with more than a 2-year college degree paid on average approximately 14.1 (45.6) percent more that their high school graduate counterparts (omitted group; *HSCHOOL*) respectively. It suggests that higher education may be a particularly important factor in wage determination for disabled people.

Turning to labor market characteristics in panel *C*, members of labor unions (part-time employees) generally earn more (less) than their non-union (full-time) counterparts, as would be expected, but there is no statistically significant effect on the wages of disabled female (male) workers respectively. Interestingly, being employed in the public sector (*PUBLIC*) is associated with significantly higher wages for both disabled male and female categories, though there is no statistically significant effect for disabled males. Such findings, however, also confirm the results of some previous studies in this area (e.g., Jones *et al.*, 2006).

As regards occupation and industry, all variables are statistically significant positive and of plausible relative magnitudes given the omitted groups (laborer occupation; *OCC6*), with just one exception - disabled females employed in the managerial, senior official, or professional occupations (*OCC1*). For both disabled male and female workers the average wage level employed in secondary and tertiary industries is higher than that of the omitted group (the primary industry; *IND1*), but there are no significant industry effects on wages of disabled females.

Finally, *IMR* (the selectivity correction term) has a negative sign and

is statistically significant for both disabled males and females, as would be expected. It suggests that some non-employed disabled people may not be able or willing to work due to their disabilities, or may not be able to access employment due to prejudice among employers. Taken at face value, the sample selection bias in the employment process has significant influence on wages of disabled male and female workers. It indicates that unobservables captured by the error term, which encourage participation in the wage sector, are associated with lower wages. Thus, some disabled people who do not work may have higher potential wages than those who work.

Table 3
Selectivity Corrected Estimates of Wage Equations

Variables (1)	Male (2)	Female (3)
Panel A: Socio-demographic Characteristics		
MARRIED (Married individual)	0.164 (0.097)*	0.064 (0.187)
RURAR (Rural region)	-0.014 (0.048)	-0.157 (0.077)**
MILD (Mild disability)	0.257 (0.054)***	0.160 (0.093)*
Panel B: Human Capital Variables		
EXP (Potential labor market experience; years)	0.023 (0.018)**	0.002 (0.033)
EXPSQ (The square of *EXP*/ 100)	-0.032 (0.019)***	-0.009 (0.036)
HSDROP (Less than a high school diploma)	-0.001 (0.056)	-0.005 (0.101)
COLLEGE (2-year college degree or above)	0.141 (0.077)*	0.456 (0.178)**
TENURE (Job tenure)	0.011 (0.003)***	0.006 (0.009)
Panel C: Labor Market Characteristics		
UNION (Labor union Membership)	0.247 (0.084)***	0.185 (0.218)
PART (Part-time employment contract)	-0.035 (0.069)	-0.229 (0.093)**
PUBLIC (Public sector employment)	0.269 (0.155)*	0.556 (0.620)
OCC1 (Managerial, senior official, or professional occupation)	0.680 (0.128)***	0.963 (0.645)
OCC2 (Clerical, administrative, or secretarial occupation)	0.514 (0.095)***	0.705 (0.156)***
OCC3 (Services, sales, or customer services occupation)	0.200 (0.084)**	0.290 (0.109)***
OCC4 (Associated professional or technical occupation)	0.398 (0.105)***	0.597 (0.253)**
OCC5 (Process, plant, or operative occupation)	0.211 (0.060)***	0.305 (0.174)*
IND2 (Secondary industry)	0.432 (0.163)***	0.031 (0.211)
IND3 (Tertiary industry)	0.340 (0.164)**	0.074 (0.206)
IMR	-0.361 (0.105)***	-0.576 (0.232)**
Constant	7.725 (0.441)***	8.593 (0.783)***
Sample Size (Observations)	805	277
R-squared (R2)	0.320	0.274
Adjusted R2	0.303	0.220
Log Likelihood	-773.9	5.105
F (p-value)	0.000	0.000

Note. Data are unweighted. Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1
Note. The F test is a test that all slope coefficients are zero.

Decomposing Gender Wage Differentials

Table 4 summaries the results of analysis of gender wage differentials among the disabled. In panel *A*, observed gender wage differentials are presented. The first and second rows provide the mean prediction of log hourly wages for disabled males and females respectively. The third row indicates gender wage differentials yielding from the first and second rows. Panel *B* provides the results of four alternative decompositions incorporating selection effects as a portion of the gender wage gap. Four selectivity corrected decompositions decomposition #1-4 are labeled corresponding to equations (4), (5), (6), and (7) respectively. The standard decomposition model without selectivity correction is used as a benchmark, labeled as 'Standard Oaxaca.' Panel *C* reports the set of decomposition results as a portion of disabled female workers' wages attributable to discrimination.[10] In this setting, the discrimination component is regarded as the wage penalty (disadvantage) in terms of the portion of disabled female workers' wages attributable to discrimination.

In terms of gender wage differentials, panel *A* reports an estimated gender wage gap of approximately 43 percent among the disabled in the Korean labor market. It indicates that disabled female workers earned 70 percent as much as their male counterparts. This figure is somewhat interesting when comparing the size of gender wage differentials among the general working population in Korea. The OECD report released in 2009 using data collected targeting 21 OECD member countries during 2006 and 2008 notes that Korean female workers earn, on average, approximately 38 percent less than their male counterparts and this is the largest gender wage gap among the OECD countries, compared to the average gender wage gap of 17.6 percent for the OECD countries. Moreover, the result also suggests that for disabled people 43 percent of the gender wage differential in Korea could be relatively larger than

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[10] In column (2) of panel *B*, the 'discrimination' component = ln (D+1) = $ln\left(\frac{W_f^0}{w_f}\right)$; where D = $\frac{w_f^0 - w_f}{w_f}$ and w_f^0 is the disabled female wage in the absence of discrimination and w_f is the observed disabled female wage. This expression represents the decomposition of gender wage differentials due to the estimated effects of discrimination (Oaxaca, 1973). In panel *C*, discrimination = D = portion of the disabled female wage attributable to discrimination. The concept of D is the wage penalty of disabled female workers.

the wage gap in other countries, e.g., 24.7-32.9 percent in the U.K. (Jones *et al.*, 2006), 42.6 percent in the U.S. (Baldwin *et al.*, 1995), etc.

Table 4
Gender Wage Decompositions

Panel A: Gender Wage Differentials		
Mean Prediction of log hourly wages	Disabled Male	8.843
	Disabled Female	8.414
Log Wage Differentials		**0.429**

Panel B: Selectivity Corrected Wage Decompositions			
Decomposition Methods	**Endowment (1)**	**Discrimination (2)**	**Selectivity (3)**
Standard Oaxaca	0.162 (37.76%)	0.267 (62.24%)	0.000 (0.00%)
Decomposition #1	0.146 (34.03%)	0.279 (65.04%)	0.004 (0.93%)
Decomposition #2	0.147 (34.27%)	0.210 (48.95%)	0.072 (16.78%)
Decomposition #3	0.219 (51.05%)	0.210 (48.95%)	0.000 (0.00%)
Decomposition #4	0.147 (34.27%)	0.282 (65.73%)	0.000 (0.00%)

Panel C: Portion of the Disabled Female Wage Attributable to Discrimination	
Decomposition Methods	**Discrimination**
Standard Oaxaca	0.306
Decomposition #1	0.247
Decomposition #2	0.269
Decomposition #3	0.269
Decomposition #4	0.305

Note. Data are unweighted.

A particular focus of this study is to investigate what factors - 'endowments,' 'discrimination,' and 'selectivity' - account for the gender wage differentials among the disabled. First, the endowment component in column (1) of panel *B* reflects the mean increase in disabled female workers' wages if they had the same characteristics (e.g., human capital accumulation) as their male counterparts. That is, the increase of 0.146-0.219 indicates that gender differences in the endowment characteristics among the disabled account from 34 percent to 51 percent of gender wage differentials. The portion explained by differences in characteristics is smallest under 'Standard Oaxaca' and largest under 'decomposition #3.' The results indicate that disabled male workers, on average, have more characteristics with higher wages than their female counterparts. And the endowments (explained) component is one important factor to explain gender wage differentials among the disabled in the Korean labor market.

Next, the discrimination component presented in column (2) of panel *B* quantifies the change in disabled female workers' wages when applying coefficients of disabled males to the characteristics of disabled females. The results show that all of the decompositions employed yield positive estimates of discrimination against disabled female workers. Specifically, the positive portion of wage differentials explained by the discrimination component (0.210–0.282) is regarded as the magnitude of gender wage differentials among the disabled due to discrimination. In addition, discrimination explains the gender wage gap among the disabled between 49 percent under decompositions #2-3 and 66 percent under Standard Oaxaca. On the whole, such findings are consistent with the results of previous studies in other countries in that the discrimination (unexplained) component plays a significant role in explaining gender wage differentials among the disabled. For instance, the estimates of the gender wage gap attributable to discrimination are 39-59 percent and 62 percent in the U.K. (Jones *et al.*, 2006) and U.S. (Baldwin *et al.*, 1995) respectively.

The gender wage gap of 43 percent among the disabled discussed above is sizable. This figure, however, provides nothing regarding the relative importance of the residual/ unexplained factor (i.e., discrimination) between the disabled and general working population, though many believe that the wage gap could be a good measure of the extent of gender wage discrimination. This is because the PSED dataset cannot answer the following question: "To what extent" gender wage discrimination of the disabled is different from those of the general working population. To compare gender wage discrimination of the disabled and the general working population, however this paper reviews literature surveys. By and large, the comparisons indicate that the extent of gender wage discrimination among the disabled is similar to or relatively larger than that of the general working population (e.g., 49-67 percent vs. 49-62 percent for Yoo & Hwang (2005)). The results suggest that the discriminator factor could play a bigger role in explaining gender differentials than the endowment factor, as is the case with the general working population in Korea.

The selection effects estimates presented in column (3) of panel *B* have positive signs and are statistically significant. It indicates that selection bias has a negative impact on gender wage differentials among

the disabled in Korea. That is, the presence of selection effects raises the observed gender wage gap among the disabled. This may in part reflect that potential disabled females with relatively lower wages are employed. In addition to this, the estimates in column (1) for the endowments component and column (2) for discrimination component vary across alternative decompositions, as a result of the imputation of gender differences in the selectivity term. This variation, as stated earlier, is not simply statistical variation but rather the consequences of what policy makers choose to label as 'discrimination' or 'endowments.'

Finally, the estimates of the portion of disabled female workers' wages attributable to discrimination (i.e., the wage penalty or disadvantage) are presented in panel *C*. This could be an alternative approach to measure and compare the level of discrimination for disabled female workers. The results show that for disabled female workers the discrimination factor accounts for 25-31 percent of wage levels in the Korean labor market. Interestingly, such findings suggest that the extent of the wage penalty (disadvantage) of disabled female workers in Korea could also be similar to or relatively larger than that in other countries, compared to 29 percent for the U.S. (Baldwin *et al.*, 1995) and 16-29 percent for the U.K. (Jones *et al.*, 2006).

Summary and Conclusions

Numerous previous studies in the literature on discrimination using decomposition approaches have focused on examining the disability effects on labor market outcomes comparing differences in likelihood of employment and levels of wages between the disabled and the non-disabled (or the general working population). In particular, the research on the comparison of gender differences among the disabled within the labor market has been relatively neglected in Korea, in both the theoretical and empirical aspects. Thus, this paper using data from the 2008 PSED (a unique Korean data set on individuals who are registered as disabled) attempts to examine gender wage differentials among the disabled working population in the Korean labor market.

A particular focus of this study is to determine the relative importance of the endowment (explained) and discrimination (unexplained) factors in the gender wage gap among the disabled in Korea. For this

reason, this paper employs selectivity corrected decompositions framework suggested by Neuman and Oaxaca (2004) to examine what factors - endowments, discrimination, and selectivity - account for the gender wage gap. The main evidence presented in this study is as follows. The wage gap of 43 percent between disabled male and female workers is substantial in Korea. Moreover, the estimated size of the gender wage gap among the disabled attributable to discrimination accounts for between 49 and 66 percent. The result suggests that for disabled people the portion of gender wage discrimination may be relatively larger than the gender wage gap explained by the endowments (explained) component. In addition to this, the results also show that gender has a significant negative impact on disabled female workers' wages (25-31 percent), i.e., the wage penalty or disadvantage. Such findings indicate that disabled female workers relative to disabled male workers may suffer significant gender-based wage discrimination in the Korean labor market.

Regarding the issue of selection bias, this paper suggests that ignoring the selection bias may be likely to produce bias estimates of gender wage differentials among the disabled when wage equations suffer from the sample selection bias. In this analysis, the presence of selection effects raises the observed gender wage differentials among the disabled. That is, selection effects do impact the portion of gender wage discrimination against disabled female workers in the Korean labor market. This evidence is once again in accordance with the usual expectation in that using decomposition methods with selectivity correction in the presence of the selection bias is appropriate (e.g., Neuman & Oaxaca, 2005).

The findings discussed above suggest that disabled females hold with a (potential) wage disadvantage relative to comparable disabled males and thus have the following important policy implications for combating disabled female workers' inferiority in the labor market. Since gender wage discrimination could reduce disabled females' incentives to work, in particular, the government and management try to find corrective measures that must be taken immediately to eliminate obstacles for full labor market participation of disabled females. National policies/ regulations, laws against discrimination such as the U.K. Disability Discrimination Act 1995 (DDA), the U.S. Americans with Disabilities Act of 1990 (ADA), etc are necessary to enhance labor market status

of disabled female workers in Korea, though this is highly controversial. Such anti-discrimination policies/ laws can help reduce disability-based discrimination in the workplace including denial of employment, negative work performance evaluations, unjust denial of promotion and/ or tenure, and sexual harassment, particularly disabled female workers.

In addition to anti-discrimination policies/ laws, a wide variety of factors (e.g., educational level, labor market experience, etc.) could impact gender wage differentials among the disabled. The evidence presented in this paper suggests that the endowments component plays an important role in explaining the gender wage gap among the disabled in Korea (38-44 percent) and may point to the importance of additional supports beyond prohibiting discrimination against disabled females. Thus, for disabled females the government and management must also adopt additional policies (environments) to improve work abilities/ skills (develop human resources) such as on-the-job-training (vocational education and training) respectively. Such policies/ regulations can help enhance disabled females' human capital stock and thus reduce the gender wage gap among the disabled through induced labor productivity growth of disable females.

This paper focuses on the gender discrimination among the disabled in the Korean labor market. Future research could seek a decomposition comparison between the disabled and non-disabled groups as a whole or even a cross-country comparison with the differences among the disabled. Under such circumstances, one could consider the possibility that the markets for the disabled work very differently than the markets for the non-disabled or there are the differences between Korean market and markets in other countries. Exploring these institutional differences would be an interesting way to compare outcomes for the disabled.

In addition to this, when measuring discrimination with decomposition analysis in the present study, differences in characteristics that are due to societal discrimination are not measured. In reality, however, the feedback effect of anticipated labor market discrimination could lead women to invest less in human capital than they otherwise would. With a different type of data, thus one could also attempt to estimate the effect of current and recent past labor market discrimination on gender differences in (human capital) investments in education, on-the-job training, etc.

Appendix A

Definition of Variables

Variables	Definitions
Panel A: Dependent Variables	
EMPL	Dummy variable: 1 if the disabled individual participates in the labor force, 0 otherwise.
LNHRW	The natural logarithm of hourly wages
Panel B: Socio-demographic Characteristics	
AGE	Workers age (years)
AGESQ	The square of *AGE*/100
MARRIED	Dummy variable: 1 if the worker is married, 0 otherwise
RURAL	Dummy variable: 1if the worker lives in the rural area, 0 otherwise
MILD	Dummy variable: 1 if degree of disability3th; (3th~6th), 0 otherwise
Panel C: Human Capital Characteristics	
EXP	Potential labor market experience (Age - 6 - years of schooling)
EXPSQ	The square of *EXP/100*
HSDROP	Dummy variable: 1 if the worker is less than high school graduates and high school dropouts, 0 otherwise
HSCHOOL (omitted group)	Dummy variable: 1if high school diploma, 0 otherwise
COLLEGE	Dummy variable: 1if 2-year college degree or above, 0 otherwise
TENURE	Workers Job tenure (years)
Panel D: Labor Market Characteristics	
UNION	Dummy variable: 1 if members of labor unions, 0 otherwise
PART	Dummy variable: 1if part-time employment, 0 otherwise
PUBLIC	Dummy variable: 1if employed in the public sector, 0 otherwise
OCC 1	Dummy variable: Managerial, senior official, and professional occupations
OCC 2	Dummy variable: Clerical, administrative, and secretarial occupations
OCC 3	Dummy variable: Services, sales, and customer Services occupations
OCC 4	Dummy variable: Associated professional and technical occupations
OCC 5	Dummy variable: Process, plant, and operative occupations
OCC 6 (omitted group)	Dummy variable: Laborer occupations
IND 1 (omitted group)	Dummy variable: Primary industry (such as agriculture and fishing)
IND 2	Dummy variable: Secondary industry (approximately manufacturing)
IND 3	Dummy variable: Tertiary industry (known as service sector/ industry)
Panel E: Other Variables	
OEARNER	Dummy variable: 1 if other salary worker in the household, 0 otherwise
CHILD	Dummy variable: 1 if dependent children under the age of 18, 0 otherwise

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