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The Disability Gap in Employment Rates in a Developing Country Context: New Evidence from Vietnam

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Abstract

Although disability prevalence is higher in low and middle-income countries, very little is known about disability and labor market experiences in this context. This is largely due to a lack of quality data on disability. This paper is the first to analyze employment rates and their determinants across disability status in a developing country, Vietnam, using nationally representative data and a high-quality disability measure based on the recommendation of the Washington Group on Disability Statistics. The association between disability and employment is further investigated by applying the non-linear decomposition method proposed by Fairlie (1999, 2003). The estimated disability gaps in full-time employment rates are 53 and 43 percentage points for men and women respectively. The decomposition analysis finds that only 8% to 27% of this gap can be explained by observed variables, signifying the importance of unobserved characteristics or factors that contribute to the disability gap and require additional attention.

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1. Introduction

Recent research shows that globally, 15% of the overall population and 9 to 12% of the working age population in the world has some form of disability (Mitra and Sambamoorthi, 2014; WHO and World Bank, 2011). In high-income and transition countries, there has been much research to explain the lower employment rates and wages of persons with disabilities (OECD, 2003, 2009; Mete, 2008). Although disability prevalence is higher in low- and middle-income countries (WHO and World Bank, 2011; Mitra and Sambamoorthi, 2014), little is known about the employment situation of persons with disabilities in such countries, mainly due to a lack of quality data on disability. Nonetheless, sizeable and significant disability gaps in employment rates have been found by Mitra and Sambamoorthi (2008) within a rural district in India, and more recently, by Mizunoya and Mitra (2013) in nine out of fifteen low- and middle-income countries. In addition, a significant disability gap in wages has been found by Mitra and Sambamoorthi (2009) in an agrarian labor market in India. These studies also show that little of the disability gap in employment outcomes was explained by observable characteristics. A major limitation of these papers is their very restricted set of explanatory variables.

This paper is the first to use nationally representative data and a high-quality disability measure as recommended by the Washington Group on Disability Statistics (Madans et al., 2011) in a developing country to analyze employment rates and their determinants across disability status, using a non-linear decomposition for males and females in urban and rural areas.

2. Empirical specifications

Firstly, we analyze the impacts of disability status and other observed individual characteristics on employment, using the following logistic model:

$$\Pr(y_i = 1) = logit^{-1}\left(a + \sum_{l=1}^{k} b_l x_{li} + c z_i\right) \text{ for } i = 1, \ldots, n, \text{ and } l = 1, \ldots, k \qquad (1)$$

where y_i is the dichotomous outcome variable of employment for individual i, in which 1 indicates being employed and 0 not being employed; a is the constant; x_i are observed individual characteristics; b_l are coefficients of observed individual characteristics; z_i is a dummy variable for disability, in which 1 indicates the experience of one or more disabilities and 0 no disability; and c is the coefficient of the disability dummy variable.

Secondly, we analyze to what extent observed individual characteristics explain the difference in employment rates of disabled and non-disabled persons using a non-linear version of the Blinder-Oaxaca decomposition method. We begin by estimating the probabilities of employment for disabled and non-disabled persons separately according to the logistic model below:

$$\Pr(y_i = 1) = logit^{-1}\left(a + \sum_{l=1}^{k} b_l x_{li}\right) \text{ for } i = 1, \ldots, n, \text{ and } l = 1, \ldots, k \quad (2)$$

where notations are as before for equation (1).

Then the estimated employment rates are decomposed using the Blinder-Oaxaca extension proposed by Fairlie (1999, 2003) for nonlinear equations. Given a nonlinear equation of form $Y = F(X\hat{\beta})$, where F is the cumulative distribution function from our logistic distributions, the decomposition can be written as

$$\bar{Y}^{ND} - \bar{Y}^{D} = \left[\sum_{i=1}^{N^{ND}} \frac{F\left(X_i^{ND}\hat{\beta}^{ND}\right)}{N^{ND}} - \sum_{i=1}^{N^{D}} \frac{F\left(X_i^{D}\hat{\beta}^{ND}\right)}{N^{D}}\right] + \left[\sum_{i=1}^{N^{D}} \frac{F\left(X_i^{D}\hat{\beta}^{ND}\right)}{N^{D}} - \sum_{i=1}^{N^{D}} \frac{F\left(X_i^{D}\hat{\beta}^{D}\right)}{N^{D}}\right] \quad (3)$$

where $\hat{\beta}^{ND}$ and $\hat{\beta}^{D}$ are the estimated coefficients from the logit regressions for the non-disabled and disabled respectively; and X_i^{ND} and X_i^{D} are observed characteristics in each group. The first term represents the "explained" portion of the employment differential between disabled and nondisabled workers, due to their different average characteristics. The second term corresponds to the "unexplained" portion of the employment differential resulting from different regression coefficients, which might be the result of unobserved characteristics related to disability.

3. Data

We used the Vietnam Household Living Standard Survey (VHLSS) 2006, a large-scale socioeconomic survey, covering all the regions and provinces in Vietnam, as this wave has questions related to disability. The sample covered in our analysis is working-age population aged 15 to 60. The VHLSS 2006 utilizes the disability standard developed by the Washington Group on Disability Statistics (Madans et al., 2011), which is intended to measure different types and degrees of disability in an internationally comparable way.[1] Their recommended questions (Washington

[1] It should be noted that so far, the 2006 wave is the only wave that has the Washington Group questions on disability. The 2008 and 2010 waves have a measure of "days of regular activity lost due to illness/injury" and a measure of "days in bed due to illness/injury". These two measures may capture the person's level of functioning in the lived environment and may thus be measures of disability as activity limitations and participation restrictions under the International Classification of Disability and Health (ICF) (WHO 2001). However, these two measures have two major limitations, which made us decide not to use them. First, they may also reflect ill-health, in particular episodes of acute illness (e.g. malaria, flu) and thus may not be about disability only. Second, these measures reflect time allocation decisions that can be influenced by the wage or other work related factors (e.g. working conditions) and therefore are endogenous with employment. This is problematic for the study of individual

Group on Disability Statistics, 2010) encompass an individual's functioning across six domains: seeing, hearing, walking, cognition, self-care, and communication; and allow respondents to self-report four increasingly severe levels of impairment: "not difficult", "a little difficult", "very difficult", and "impossible". In this paper, those who answered "very difficult" or "impossible" are considered as disabled persons (DP), as per the Washington Group recommendations[2]. The "a little difficult" category, which can be considered as a "Mild and Moderate" difficulty response category, has not fared well in cognitive testing (Miller et al., 2010) and thus is not considered as 'disability' in this paper.

The binary dependent variable for employment is constructed using non-student samples in working-age (15 to 60 years old) if they work eight or more hours per day in wage-earning or self-employment activities. The independent variables on individual characteristics included in the logistic regressions are age, age squared, a marital status dummy, years of education, a Vietnamese ethnicity dummy, years of education of the household head, the number of children in the household, household size, an urban dummy, and regional dummies.

According to our descriptive statistics, numbers of observations for males and females without disabilities and males and females with disabilities are 10,246, 10,780, 263, and 225 respectively. Overall, disability prevalence is 2.0% (males, 2.1%; females 1.8%). Also, our descriptive statistics show that percentage of people with multiple disabilities is 1.0% (0.97% for male and 0.75 % for female). There is an employment gap of 53 percentage points between non-disabled and disabled men, and 42 percentage points between non-disabled and disabled women. Interestingly, the female employment rate among the disabled (34%) is higher than that of disabled males (29%). Additionally, there are gaps in the shares of married persons and years of education completed by the non-disabled and disabled groups. Non-disabled men have on average 8.0 years of education, compared to 5.6 years for disabled males. Similarly, the average years of education for non-disabled and disabled females are 7.3 and 4.1 years respectively.

4. Results[3]

Table 1 presents the results of the logistic regression on full-time employment for various sample groups given the individual characteristics. In the first two columns, the coefficients of the disability dummy for both males (-2.24) and females (-1.70) are negative, as expected, and statistically significant at the 1% level. The marginal effects of experiencing disability on employment calculated from the results in Table 1 based on means of independent variables using survey weight are -0.493 for male and -0.368 for female, suggesting the disabled employment rate is 49.3% and 36.8% lower than that amongst non-disabled men and women respectively, *ceteris paribus*.

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labor market outcomes, as in this paper.

[2] The wordings of choices on disability in Washington Group recommendations are (1) no difficulty, (2) some difficulty, (3) a lot of difficulty, (4) cannot do at all/unable to do, which are slightly different from the ones in VHLSS. However, since the meanings are the same, we regard the questions on disability in VHLSS are the same as Washington Group recommendations.

[3] Authors used STATA for estimations in this paper.

In Table 1, the coefficients of covariates are as expected. The coefficients vary in magnitude and statistical significance between disabled and non-disabled groups, in particular with respect to age for women; years of education of the household head for men; marital status dummy and years of education for both women and men. The differences in coefficients found across disability status justify conducting a decomposition analysis, as the relevant observables are associated differently with the probability of employment depending on disability status.

Table 1 Logistic estimations of employment

	Male	**Female**	**Male**		**Female**	
	(1)	**(2)**	**(3) Non-DP**	**(4) DP**	**(5) Non-DP**	**(6) DP**
Age	0.175***	0.233***	0.181***	0.151*	0.235***	0.0655
	(0.0273)	(0.0235)	(0.0162)	(0.0847)	(0.0139)	(0.0819)
Age squared	-0.0025***	-0.0031***	-0.0026***	-0.0022**	-0.0032***	-0.00086
	(0.000342)	(0.000314)	(0.000202)	(0.00105)	(0.000181)	(0.00105)
Married	0.426***	-0.236**	0.321***	1.225***	-0.261***	0.646*
(yes=1, no=0)	(0.122)	(0.0975)	(0.0921)	(0.444)	(0.0624)	(0.375)
Years of	0.0316**	0.0493***	0.0219**	0.0426	0.0386***	0.0780*
education	(0.0134)	(0.00960)	(0.00903)	(0.0428)	(0.00793)	(0.0415)
Vietnamese	0.0962	-0.0407	0.0981	0.110	-0.115	0.440
(yes=1, no=0)	(0.171)	(0.150)	(0.0853)	(0.579)	(0.0849)	(0.534)
Disability						
status	-2.237***	-1.702***				
	(0.270)	(0.220)				
Years of	-0.0144	-0.0341	0.0160	-0.367**	-0.0245	-0.0348
education of	(0.0503)	(0.0352)	(0.0277)	(0.172)	(0.0235)	(0.146)
household head						
Number of	0.0150	-0.00671	0.0201	0.0190	-0.00964	0.0752
children in	(0.0162)	(0.0191)	(0.0141)	(0.0874)	(0.0129)	(0.0972)
household						
Household size	-0.00259	-0.0345	0.0224	-0.189*	-0.0257*	-0.212**
	(0.0234)	(0.0264)	(0.0167)	(0.0979)	(0.0143)	(0.0937)
Urban (yes=1,	0.258***	0.0512	0.261***	0.716*	0.114*	-0.242
no=0)	(0.0672)	(0.113)	(0.0707)	(0.400)	(0.0616)	(0.431)
Constant	-1.749***	-2.384***	-1.939***	-2.426	-2.281***	-2.104
	(0.491)	(0.448)	(0.298)	(1.814)	(0.265)	(1.740)
N	10,509	11,005	10246	263	10780	225

Notes: Standard errors in parentheses. Regional dummies are included in the analysis but not shown here.

* Significance, p<0.10; ** Significance, p<0.05; *** Significance, p<0.01.

Table 2 summarizes the logistic decomposition of employment probability for the disabled and non-disabled by sex and urban/rural residency. The average male employment rates are 81.2% (non-disabled) and 28.5% (disabled), yielding a disability gap of 52.6%. Using the non-disabled

and pooled male samples as references, 9.2% and 13.5% of the gap respectively is explained by differences in explanatory variables related to productivity. Amongst women, the employment rates are 76.4% (non-disabled) and 33.8% (disabled), yielding a disability gap of 42.6%. With the non-disabled and pooled female samples as references, 10.5% and 15.0% of the gap respectively is explained by differences in explanatory variables. The results confirm that a large portion of the disability gap in employment rates is unexplained by observed characteristics. This conclusion holds when the same analysis is conducted for urban and rural samples; the explained proportions of the disability gaps are larger for urban inhabitants (14.3-19.1% and 23.1-27.2% for urban males and females, and 8.0-12.1% and 7.8-12.7% for rural males and females, respectively), yet are still relatively small shares of the total differences.

We performed robustness checks for workers who work six hours or more per day. The unexplained gap was slightly smaller but quite comparable with the main results. Furthermore, we examined the impact of household wealth by adding a supplementary variable on household socio-economic status, but the results were also similar.

Table 2: Logistic decomposition of the probability of employment given disability status

Sample	People	Reference	Mean of dependent var.		Difference	Total explained	Total explained share of the difference (%)
			Non-DP	DP			
All	Male	Non-DP	0.812	0.285	0.526	0.048	9.2%
	Male	Pooled				0.071	13.5%
	Female	Non-DP	0.764	0.338	0.426	0.045	10.5%
	Female	Pooled				0.064	15.0%
Urban	Male	Non-DP	0.853	0.318	0.534	0.076	14.3%
	Male	Pooled				0.102	19.1%
	Female	Non-DP	0.779	0.340	0.439	0.101	23.1%
	Female	Pooled				0.119	27.2%
Rural	Male	Non-DP	0.798	0.274	0.524	0.042	8.0%
	Male	Pooled				0.063	12.1%
	Female	Non-DP	0.759	0.337	0.422	0.033	7.8%
	Female	Pooled				0.054	12.7%

5. Discussion

For the first time, we provide evidence about the disability gap in employment rates in a developing country, Vietnam, using high-quality data on disability. The results of a logistic analysis show disabilities associate with a decrease in employment rates by 53% and 42% for males and females, respectively, holding other characteristics constant. Through the logistic regression, we also find different returns to characteristics, in particular higher coefficients for years of education for men and women with disabilities, albeit not statistically significant at 5%. For men with disabilities,

lower years of schooling of the household head are significantly associated with a lower probability of employment. These results are consistent with those of a growing literature pointing towards higher returns to education among persons with disabilities in low- and middle-income countries (Lamichhane, 2014; Lamicchane and Sawada, 2013) and warrant further research.

Subsequent decomposition finds that the explained shares of the disability gap range from 8 to 19% for men, and 8 to 27% for women. Thus, a large proportion of the disability gap is not attributable to observed characteristics, which is consistent with previous findings (Mizunoya and Mitra, 2013). The question then is what lies behind the unexplained portion of the disability gap in employment rates. It may result from a variety of factors, including lower productivity, disincentive effects of government programs, physical and social barriers in the general environment and in the workplace. Whether it reflects lower productivity depends on the types of disabilities that prevail and the types of jobs available and the tasks they involve, and many other factors such as the availability of assistive devices that may increase productivity. It may be due to the availability of social protection benefits associated with disability. Vietnam has had a national disability law since 2010, which covers a range of social protection supports for persons with disabilities (Disability Law. 51/2010/QH12, 2010). Persons with severe disabilities are entitled to monthly cash transfers, health insurance, and public bus fare and other travel exemptions. However, social protection programs have been reported as not widely accessible (Palmer et al., 2015) and not much relied upon when households face illness or disability shocks (Mitra et al., 2015). The unexplained gap may also be due to a physical environment that is inaccessible, broadly (e.g. infrastructure, transportation) and in the work place. It could also be due to discrimination. On the supply side, negative attitudes on the potential of people with disabilities to work successfully might lead them or their families to low expectations and limited labor supply. On the demand side, employers might be prejudiced or there might be statistical discrimination, whereby given visible disabilities, employers would not hire given lower expected productivity, whether this expectation is accurate or not. In a recent qualitative study (Palmer et al., 2015), persons with severe disabilities report that lower educational attainment, lower productivity, inaccessible environments, including discrimination, are drivers of the worse work outcomes for persons with disabilities in Vietnam. This paper shows that the lower educational attainment of persons with disabilities accounts for only a limited share of the disability gap in the employment rate. If the unexplained portion of the disability gap reflects prejudice and discrimination, this highlights the need for public and employer policies to reduce discriminatory attitudes and practices.

More broadly, this paper therefore demonstrates the need for policymakers and researchers working towards inclusive growth and development in low- and middle-income countries to pay increased attention to disability, especially within the context of work and economic wellbeing. This attention needs to be multifaceted and address several issues, including inclusive education, accessibility and discrimination.

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