Disability, Education, and Employment in Nepal

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Background

- Over a billion people, about 15% of the world's population, have some form of disability (World Report on Disability, 2011).

- Eighty percent of the world's disabled people live in developing countries, making the worldwide disabled population collectively one of the poorest and most marginalized segments of society (ILO, 2007; UN 2006; UNDP, 2006).

- There has been a significant shift in approaches to disability:
  - Historically, people with disabilities were treated as passive recipients of support based on feelings of pity.
  - During the civil rights era of the 1960s and 70s, a wide variety of strategies and programs intended to affect a shift from policies based on exclusion, with targeted charities, toward policies embracing persons with disabilities were introduced worldwide (Cook and Burke, 2002).
  - A paradigm shift from "the medical model" to "the social model" of disability
  - UN Conventions of the Rights of Persons with Disabilities (adopted by the UN General Assembly on Dec 13, 2006)

Remaining Issues

- Emerging evidence shows a vicious cycle of low education and subsequent poverty among people with disabilities in developing countries (Filmer, 2008; World Report on Disability, 2011).

- Yet, it is still unclear:

  - To what extent inclusive development for persons with disabilities has been successfully implemented in developing countries.

  - What are the obstacles of schooling and employment of disabled people.

  - How the government can design effective policies.

- Need to improve the availability and quality of data on disability (World Report on Disability, 2011).

Purpose of this Study

- The purpose of this paper is to bridge this gap by focusing on the role of education in the labor market of a developing economy, namely, Nepal.
  - Returns to investment in education have been quantified for nondisabled people since the late 1950s (Card, 1999, 2001; Heckman et al., 2006; Psacharopoulos and Patrinos, 2004).
  - However, as far as developing countries are concerned, almost no studies that estimate the return to education of persons with disabilities can be found.
- Therefore, with this paper, we aim to at least partially fill this gap in existing knowledge by estimating the wage returns to education of individuals with disabilities in Nepal.
  - By doing so, we intend to help identify constraints preventing people with disabilities from becoming socially and economically independent, and from being fully included in society.
  - Such an analysis will better enable governments and concerned organizations to design policies to mitigate poverty among persons with disabilities, the largest minority group in the world.

Methodology

- To estimate returns to education, we employ (1) unique data collected from persons with hearing, physical, and visual impairments as well as (2) nationally representative survey data from the Nepal Living Standard Survey 2003/2004 (NLSS II).

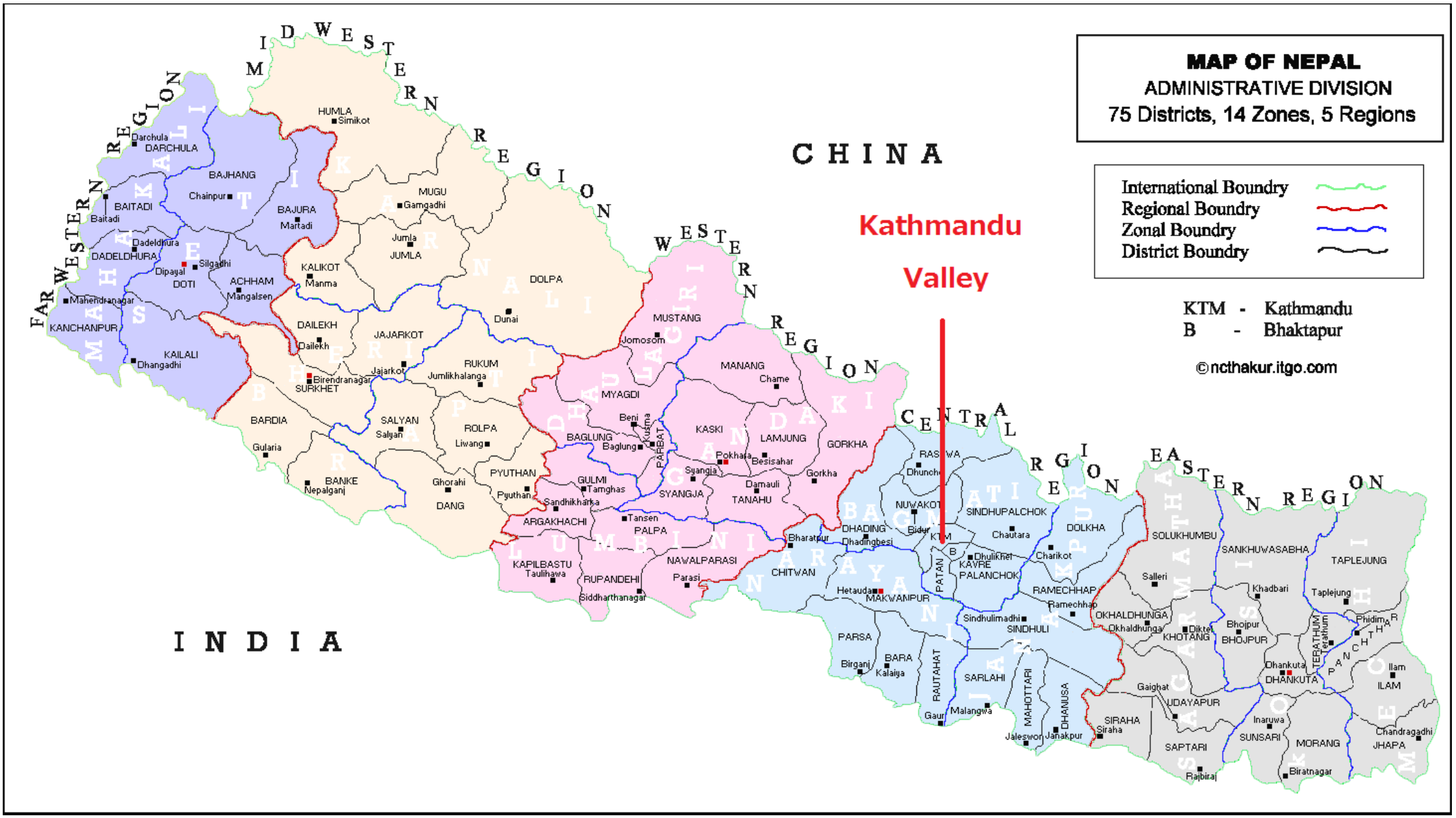
  - The first author has collected unique data from persons with hearing, physical, and visual impairments living in Nepal's Kathmandu Valley using carefully-structured questionnaires. The size and coverage of this survey are unprecedentedly large in Nepal; it is essentially the first of its kind, given the general lack of studies on disability issues in Nepal (Lamichhane, 2009).

  - We also use available information on disability from the nationally representative survey data of the Nepal Living Standard Survey 2003/2004 (NLSS II).

- Information on congenital or acquired disability as well as the timing of getting impairment before or during school-age years is used as identifying instrumental variables for years of schooling.

  - The labor market outcome of education is not directly dependent on a distinction between congenital or acquired disabilities.

Location of Kathmandu Valley

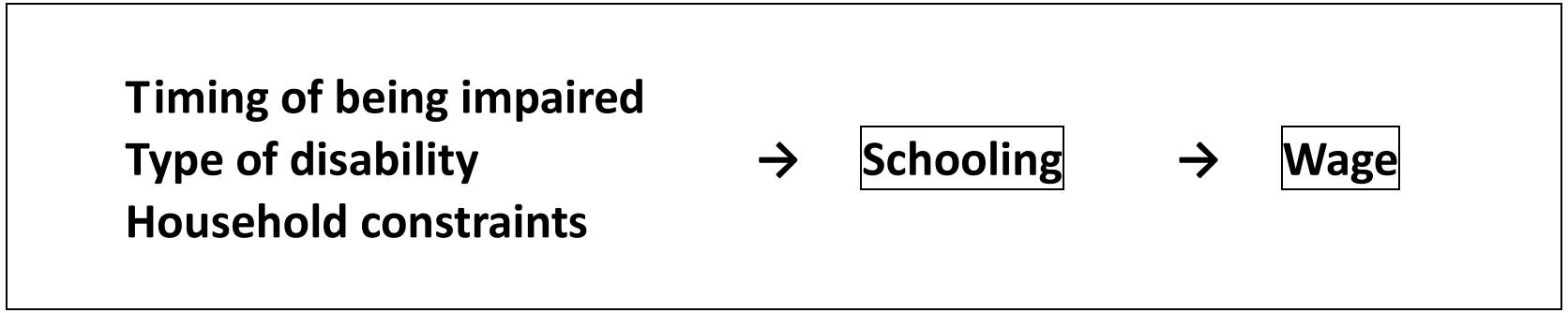


Presentation Outline

- Empirical strategy I: Micerian wage equation
- Data set from Nepal
- Our findings
- Empirical strategy II: Determinants of employment
- Concluding remarks

Empirical strategy I

- Mincerian wage equation (Heckman, Lochner, and Todd, 2006; Card, 1999, 2001, considering endogenous determination of years of education.



(1) $$\log w = rS + X\beta + u,$$

w = wage
S = years of schooling
r = the returns to education
u = an error term.

- Schooling year choices:

(2) $$S = Z\gamma + \varepsilon,$$

Z = a set of instrumental variables which satisfies that $E(SZ) \neq 0$ and $E(Zu) = 0$.

- To control for the sample selection bias arising from endogenous labor market participation, we employ Amemiya's Type 1 Tobit model (1985) with endogenous regressors. We adopt Newey's (1987) modified minimum chi-squared estimator with the two-step estimation method.

Data

- The two rounds of the survey for this study were conducted in Nepal's Kathmandu Valley in 2008.
  - Persons with visual, hearing, and physical impairments were chosen for face-to-face interviews using carefully-structured questionnaires.
  - To approach these respondents, we randomly selected interview participants from the name lists of the five disability-related organizations in Kathmandu, Lalitpur, and Bhaktapur districts
  - We further divided the members and contacts aged between 16 and 65 years in each disability group into male and female subgroups.

- Then, out of a total of 993 potential participants who met our age and impairment criteria, 423 respondents were randomly selected using proportionate stratified random sampling.

- The survey covers a wide variety of socioeconomic information including impairment, demographic characteristics, education background, employment status, attitudes of family and employers, and income and expenditure.

- For Robustness, we also employed NLSS II (large-scale nationally-representative data; 2003/04)

Descriptive Statistics

- 55.8%: currently participate in the labor market; 41.7%: full-time workers
- The average number of years of schooling was 8.84 years
- The proportions of visually, hearing, and physically impaired people were 30.2%, 37.9%, and 31.9%, respectively.
  - Of the respondents with an acquired impairment, 71.1% had become disabled before the age of six.
  - 13.6% of the respondents claimed that they had received no institutional support for their studies, and a further 23.1% reported that their families had suffered financial constraints in order to send them to school.

Table 1. Descriptive Statistics

Variable name	Obs.	Mean
Dummy = 1 if full-time worker	398	0.417
Age	398	31.053
Years of schooling	398	8.844
Dummy = 1 if visually impaired (default category)	398	0.302
Dummy = 1 if hearing impaired	398	0.379
Dummy = 1 if physically impaired	398	0.319
Dummy = 1 if disabled when age is below 6 (default category)	398	0.711
Age when a person became disabled	398	4.275
Dummy = 1 if there is no support for studying	398	0.136
Dummy = 1 if financially constrained	398	0.231

Results and findings

- The first-stage regression results
  - Hearing impairment is shown to have negative and statistically significant coefficients.
  - Disability acquired at a later age is (non-liearly) correlated with longer years of schooling.
  - The seriousness of the financial constraints

Table 2. First-Stage Regression (selected variables)

Dependent variable	(1)		
	Coef.	Std. Err.	
Dummy = 1 if hearing impaired	-2.394	(0.577)	***
Dummy = 1 if physically impaired	1.716	(0.604)	***
Dummy = 1 if congenital disability	0.497	(0.602)	
Age when a person became disabled (which is set at 23 if above 23)	0.277	(0.123)	**
Dummy = 1 if disabled when age is between 6 and 11	-1.304	(0.871)	**
Dummy = 1 if disabled when age is between 11 and 16	-2.702	(1.226)	*
Dummy = 1 if disabled when age is above 16	-6.031	(2.366)	**
Dummy = 1 if financially constrained	-1.172	(0.477)	**
Number of observations		373	
F statistics for the jointly zero coefficients		10.27	
[*p*-value]		[0.000]	
R-squared		0.3924	
Adjusted R-squared		0.3542	

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Results and findings

- More elaborated specifications of the first-stage regression.
  - Specific to people with visual impairments, disability at a later age is correlated with fewer years of schooling.
  - Difficulty in learning different, disability-specific skills, such as learning to use Braille or Orientation and Mobility (O&M) skills in the case of visually impaired students.

Table 2. First-Stage Regression (selected variables)

Dependent variable	(2)		
	Coef.	Std.Err.	
Age when a person became disabled (which is set at 23 if above 23)	0.591	(0.216)	***
(interacted with hearing impairment dummy)	-0.365	(0.321)	
(interacted with physical impairment dummy)	-0.550	(0.336)	*
Dummy = 1 if disabled when age is between 6 and 11	-3.763	(1.697)	**
(interacted with hearing impairment dummy)	2.892	(2.339)	
(interacted with physical impairment dummy)	4.147	(2.322)	*
Dummy = 1 if disabled when age is between 11 and 16	-5.162	(2.310)	**
(interacted with hearing impairment dummy)	3.355	(3.307)	
(interacted with physical impairment dummy)	3.282	(3.318)	
Dummy = 1 if disabled when age is above 16	-12.569	(4.310)	***
(interacted with hearing impairment dummy)	10.022	(5.712)	*
(interacted with physical impairment dummy)	10.430	(6.447)	
Dummy = 1 if financially constrained	-1.265	(0.491)	***
Number of observations		373	
F statistics for the jointly zero coefficients		6.71	
[*p*-value]		[0.000]	
Adjusted R-squared		0.3429	

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Results and findings

- Estimated results of wage earnings equations.
- OLS: The rate of return is about 5.3–5.9%
- Tobit: 21.4–22.9%
- IV Tobit: 30.4–33.2%

Table 3. Estimation Results of Earnings Regression
Dependent variable: Log hourly wage

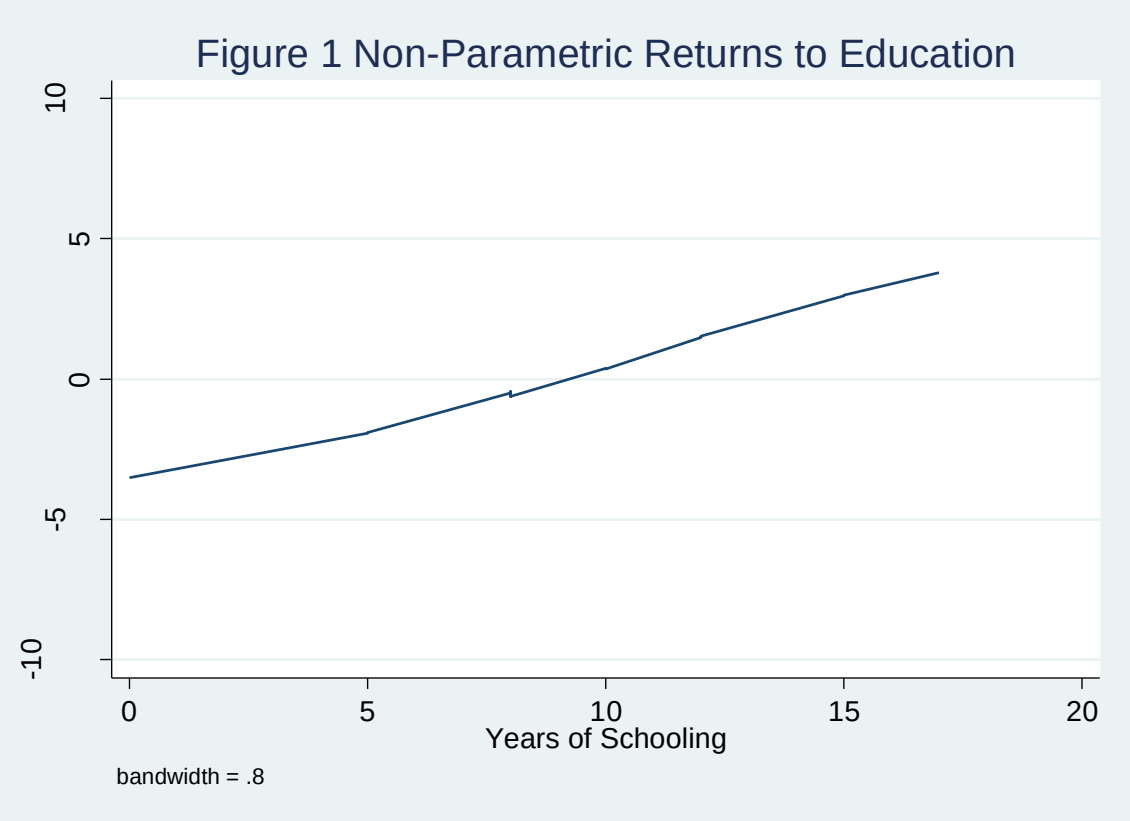
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	Tobit	Tobit	IV-Tobit	IV-Tobit
Years of schooling [+]	0.053	0.059	0.229	0.214	0.322	0.312
	(0.026)**	(0.031)*	(0.060)***	(0.066)***	(0.168)*	(0.156)***
Number of observations	222	222	398	398	373	373
R-squared	0.06	0.07				

Control variables: Dummy = 1 if female; Age; Age squared; Dummy = 1 if full-time worker; Dummy = 1 if hearing impaired; Dummy = 1 if physically impaired.

Robustness Tests

- Three additional analyses

(1) Used a semi-parametric regression model to relax the function form and mitigate specification errors. We adopt the semi-parametric instrumental variable approach used by Holly and Sargan (1982), Blundell et al. (1998), and Gong et al. (2005):



Robustness Tests

(2) Conducted tests to handle the weak instrument problem following Andrews, Moreira, and Stock (2009), adjusting the critical values of test statistics in the presence of weak instruments.

(3) Employed alternative, large-scale, and nationally representative data from NLSS II conducted by the Central Bureau of Statistics (CBS) of the government of Nepal. Note that since NLSS II is not designed to capture impairments and disabilities, there is only limited information on persons with disabilities.

Table 5. Estimation Results of Earnings Regression

	(1)	(2)	(3)	(4)	(5)
	OLS	IV	OLS Disabled Sample	IV Disabled Sample	IV-Tobit Disabled Sample
First-stage specification in Table 5		(1)		(2)	(2)
Years of Schooling [+]	0.131 (0.004)***	0.091 (0.014)***	0.156 (0.029)***	0.200 (0.080)**	0.194 (0.099)**
Number of Observations	3,601	3,601	278	278	278
R-squared	0.4	0.38	0.56	0.55	
Adjusted R-squared		0.38		0.54	

Control variables: Dummy = 1 if female; Age; Age squared; Dummy = 1 if born in an urban area; Dummy = 1 if not suffered from chronic disease;

Robustness Tests

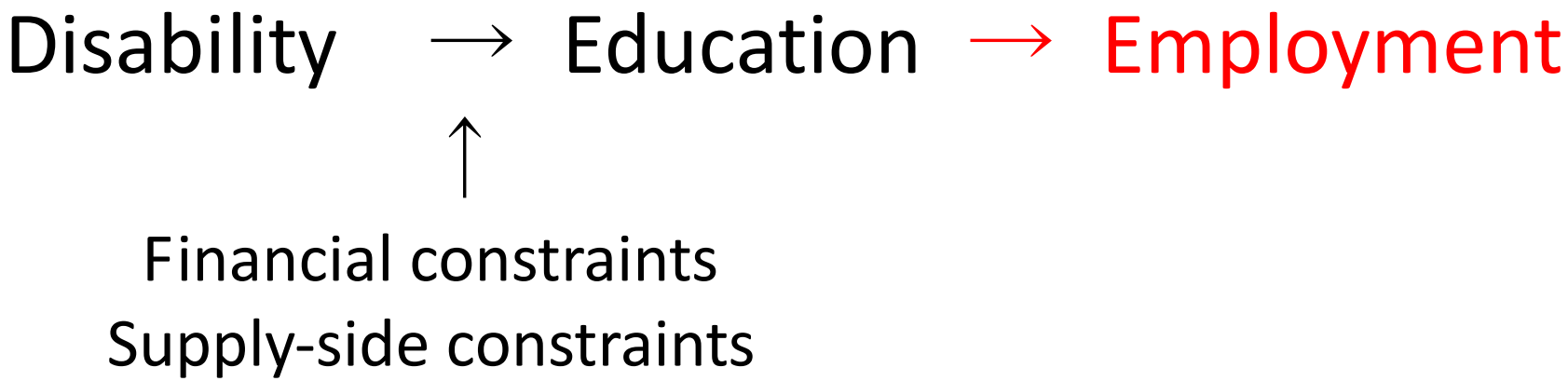
- First stage regression results using NLSS II:

Table4. First-Stage Regression; Dependent variable: Year of Schooling

	(1)		(2)	
	While Sample		Disabled Sample	
	Coef.	Std. Err.	Coef.	Std. Err.
Dummy = 1 if female	-2.809	(0.145)***	-2.744	(0.575)***
Age	0.192	(0.033)***	0.031	(0.143)
Age squared	-0.003	(0.000)***	-0.001	(0.002)
Dummy = 1 if born in urban area	4.405	(0.349)***	3.131	(1.030)***
Dummy = 1 if not suffered from chronic disease	-0.526	(0.320)**	-1.392	(1.049)
Dummy = 1 if did not attend school because of disability	-2.465	(2.905)	-1.976	(1.101)**
Dummy = 1 if financially constrained	-3.888	(0.221)***	-3.635	(0.828)***
Age when a person became disabled (which is set at 23 if above 23)	0.189	(0.094)***	0.083	(0.065)
Constant	-1.030	(2.179)	2.944	(2.713)
F statistics for the jointly zero coefficients	124.18		9.55	
[*p*-value]	[0.000]		[0.000]	
R-squared	0.216		0.221	
Adjusted R-squared	0.214		0.198	
Number of observations	3,601		278	

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Empirical strategy II



Empirical strategy II

- Employment conditions and disability

Disability and Employment Characteristics
(Among those who are employed)

	Visual Impairment	Hearing Impairment	Physical Impairment	Average
Full-time	65.79%	84.04%	52.63%	70.04%
Part-time	13.16%	6.38%	24.56%	13.22%
Self-Employed	21.05%	9.57%	22.81%	16.74%
Total	100%	100%	100%	100%
Sample Size	76	94	57	227

Note) 166 respondents (41.2%) are out of labor force

Disability and Job Classification
(Among those who are employed)

	Visual Impairment	Hearing Impairment	Physical Impairment	Average
Blue-collar	31.58%	77.66%	24.56%	48.90%
White-collar	68.42%	22.34%	75.44%	51.10%
Total	100%	100%	100%	100%
Sample Size	76	94	57	227

Note) 166 respondents (41.2%) are out of labor force

Empirical strategy II

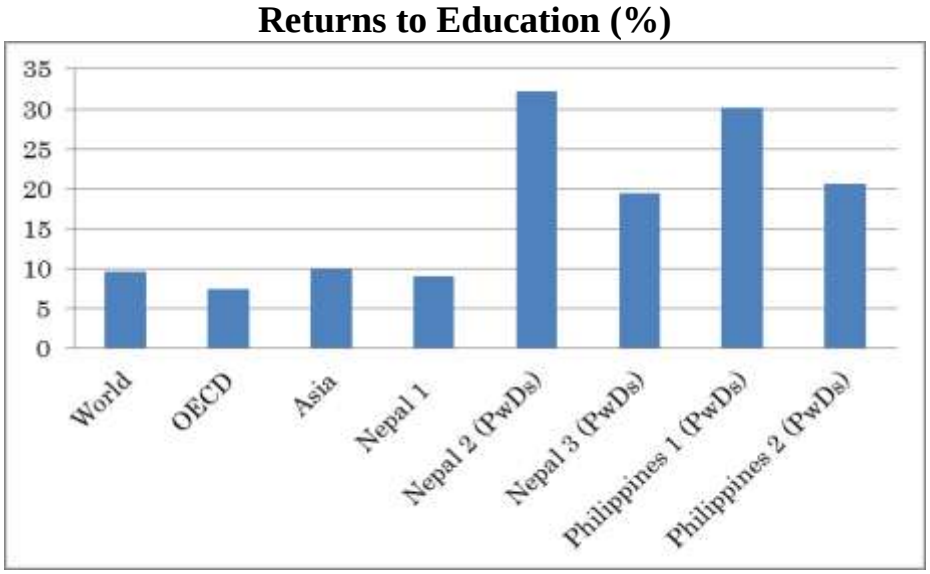
- Determinants of employment status and hours worked: years-of-schooling, type of impairments, and age are significant in predicting the likelihood of participants' employment.

Dependent variable	**Full-time (3) Part-time (2) Self-employed(1) Out of labor force (0)**	**White-collar(3) Blue-collar (2) Out of labor force (1)**	**Hours of work per week**
Estimation Method	IV ordered probit	IV ordered probit	IV Tobit
Years of schooling (endogenous)	0.110	0.129	4.515
	(0.015)***	(0.015)***	(1.070)***
Female	-0.091	0.031	-5.783
	(0.132)	(0.131)	(4.194)
Age	0.107	0.097	1.493
	(0.045)**	(0.044)**	(1.541)
Age square	-0.001	-0.001	-0.013
	(0.001)**	(0.001)*	(0.022)
Hearing impairment	0.302	-0.107	22.735
(Compared with Visual Impairment)	(0.159)*	(0.156)	(6.143)***
Physical impairment	-0.799	-0.587	-16.964
(Compared with Visual Impairment)	(0.168)***	(0.169)***	(5.208)***
Observations	393	398	359

Note) Other control variables are included but not shown. We used the long version of IVs as before.

Remarks

- The estimated rate of returns to education is very high among persons with disabilities in Nepal, ranging from 19.4 to 32.2%
  - ➢ This is so even after controlling for sample selection bias due to endogenous labor participation as well as endogeneity bias arising from schooling decisions.
  - ➢ High return rates (>20%) are also found among persons with disabilities in the Philippines (Mori, Yamagata, Albert, Reyes, Tabuga, and Yap, 2010)
  - ➢ The rate of returns is significantly higher than that of non-disabled people.



Source) The figures for the world, OECD, Asia, are taken from Psacaropoulos and Patrinos (2004). The numbers for Nepal 1 (persons with and without disability), Nepal 2 (persons with disability), and Nepal 3 (persons with disability) are from Lamichhane and Sawada (2009). The numbers for the Philippines are taken from Mori, Yamagata, Albert, Reyes, Tabuga, and Yap (2010).

Remarks

- The coexistence of these high returns to education and limited years of schooling suggest that there are (1) credit market imperfections and/or (2) supply side constraints in education to accommodate persons with disabilities.

- Years-of-schooling, type of impairments, and age are significant in predicting the likelihood of participants' employment.

- Policies to eliminate these barriers will mitigate poverty among persons with disabilities, the largest minority group in the world.

Ongoing Projects

Project I: Integrated Schools

- Whether "integrated **Schools**" help resolve the stigma towards PwDs (Persons with Disabilities)?
- Survey and experiments
  - A survey in 7 integrated schools in Nepal from Dec 2010 to Feb 2011 (sample size: about 3,600 students)
  - Artefactual economic experiments in one of the schools to elicit the discriminatory behavior (experimentee: about 200 students)
  - We compare non-PwDs in the sections with PwDs and without PwDs in the same grade.

Project II: Teachers with Visual Impairments (TVIs).

- In Nepal, TVIs teach in regular schools.
- What is the performance of TVIs?
- Anecdotal evidence from school principals:
  - TVIs are hardworking, partly because they cannot easily be hired once they are fired.
  - Students also do not complain about the class, unlike for non-TVIs.
  - In the 7 schools we surveyed, there are about 15 TVIs. We are examining test scores of the students taught by TVIs and nonTVIs.

Future Projects

Project III (FY 2011-12): Civil War in Nepal

- There was a civil war in Nepal from 1996 to 2006.
- Government vs. Maoists.
  - More than 15,000 lost their lives
  - More than 10,000 victims, disappeared, injured or disabled

Project IV (FY2012): Household Survey

- Multi-purpose household surveys in several districts in Nepal through disability-related organizations