

The Effects of Disability on Earnings in China and the United States

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Abstract: This paper compares earnings disparities between persons with disabilities and able-bodied persons in the United States and in China, two countries with widely differing public policies regarding employment of persons with disabilities. In doing so, the paper provides readers with a unique comparative perspective on both the nature of disability policies in China and the United States and on the impacts of these policies. Data from the China Household Income Project Survey (CHIPs) and the US Current Population Survey (CPS) are used to estimate earnings equations in China and the US to test the hypothesis that the adverse impacts of disability on earnings differ between the two countries. The disability rates in the two samples are comparable as are the percentage differences in earnings between persons with disabilities and able-bodied persons. However, the estimated impacts of disability on wage and salary incomes are larger in the United States, where disability policy is essentially an anti-discrimination policy than they are in China, where disability policy includes an affirmative action requirement mandating that employers hire a quota of employees with disabilities against a threat of fines and penalties. The analysis has broad implications for understanding how and why anti-discrimination policies may not be enough to narrow earnings gaps between persons with disabilities and the able-bodied.

Key Words: disability policies, wage inequality, employment and disability

Introduction and Motivation for the Analysis

This paper compares the effects of disability on wage and salary incomes in China and the United States. The motivation for the comparative analysis stems from the widely differing application of laws regarding disability in the two countries. In the United States, the Americans with Disability Act (ADA) is in essence an anti-discrimination law. Employers must not discriminate against persons with disabilities in hiring, promotions, training, pay, and other aspects of functioning in the workplace (<http://www.ada.gov/pubs/adastatute08.htm>).

By way of contrast, the 1991 Law on the Protection of Disabled Persons in China, which also prohibits discrimination against persons with disabilities, specifically contains a unique affirmative action mandate: all firms are required to hire a quota of persons with disabilities² (International Labor Organization, 2008). Would one expect the effects of disability on earnings in a country with an anti-discrimination mandate to be higher or lower than the effects in a country with an affirmative action and anti-discrimination mandate? In short, is anti-discrimination enough to overcome the adverse impacts of disability on earnings in labor markets?

Another motivation for the comparative analysis is that both countries produce conflicting measures of disability between different data sets. For example, in the United States, one widely used data source on health and disability is the National Health Interview Survey (NHIS). Compilations from that data set reveal that in urban areas rates of persons with disabilities are lower than in rural areas. For the year 2000, for example, the urban rate for persons with disabilities, for people 18 to 60 years of age is calculated to be 8.15 percent whereas in rural areas it is found to be 12.27 percent³ (U.S. Dept. of Health and Human Services, 2000). For the same year, the U.S. Census Bureau reported that 9.7 percent of persons ages 16 to 64 had sensory, physical, mental, or self-care disabilities (Erickson and Lee, 2005). However, in the Current Population Survey (CPS) data, compiled by the U.S. Census Bureau and the premier source of nationally representative information on wage and salary income and employment, the rates are 2.92 percent and 3.20 percent, respectively. In the NHIS data set, disability is defined as any health limitation; whereas in the CPS data set, disability refers to any lasting physical or mental health condition that causes difficulty working, limits the amount or type of work one can do, or prevents a person from working altogether. The CPS definition excludes temporary health conditions, such as broken bones or pregnancies. Time series information collected by Houtenville and Adler (2001) reveals self-reported rates of disability of between 7 percent and 10 percent for the period 1980 to 2000 in the United States. The Houtenville and Adler measures focus on work limitations due to both poor health and disability and thus may overstate the measure included in the CPS data, which distinguishes between poor health and the presence of a disability. In short, some United States government data sets, such as the CPS – which focus on non-institutionalized working age populations – produce disability rates considerably lower than other official data sets.

In China, there are also substantial differences in disability rates across different data sets. The main source of information on disability in China is the National Sampling Survey for Disability in China (Statistics Bureau of China, 2006) where the rural and urban disability rates for 2006 are found to be 6.95 and 5.29 percent, respectively. The most detailed source of information on income in China is the Chinese Household Income Survey (CHIPs). This data set is a sample drawn by researchers from the Chinese Academy of Social Sciences from data collected by National Bureau of Statistics. Analysis of that data set found an overall disability rate of 3.2 percent among the working age population, 18 to 60 years of age, with a rate of 6.2 percent in the urban sample and 1.4 percent in the rural sample (Myers & Ding, 2009). There are perceptible differences in the definitions of disability between the two Chinese surveys as well as between the rural and urban portions of the CHIPs survey, although the calculations for the urban areas in both data sets are remarkably similar.⁵

Thus, when using two data sets from two countries that focus on wage and salary incomes and that both report comparable measures of disability in China and the United States, does one find different disparities in income between persons with disabilities and able-bodied persons? The attractiveness of using the CHIPs and the CPS urban data sets is that both produce comparable percentages of persons with disabilities among those who work.

This paper proceeds in the following way. First, we sketch out some key features of disability and employment in China and the United States. Then, we describe the economic model of earning differentials between persons with disabilities and able-bodied persons, based largely on economic models of disability in the United States. We summarize the data and present our results. In a concluding section, we discuss the alternative interpretations and policy implications of our findings.

The Chinese Context

Definition of Disability

In China, disability is officially defined as abnormalities or impairments of one or more of the following six abilities: visual, hearing, verbal, physical, intellectual, and psychiatric, according to the Second National Sampling Survey for Disability in China (NSSD). Notably excluded from the definition of disability in China are learning disabilities and disabilities caused by substance abuse (Hampton, 2001). The primary source of information on disability is The National Sampling Survey for Disability in China conducted in 1987 and 2006. The first survey targeted 29 provinces and involved 1.5‰ of the total population by group sampling (Statistics Bureau of China, 1987); these numbers increased to 31 provinces and 1.93‰ of the total population in the second survey (Statistics Bureau of China, 2006). There is limited information on economic characteristics and income in the NSSD, rendering this data set less useful for an analysis of labor market discrimination against persons with disabilities.

A second important source of information on persons with disabilities exists in the Chinese Household Income Project Survey (CHIPs). The urban sample consists of a stratified random of cities and towns (NBS, 2009b), where stratification is based on province and city and town size. The sampling of households within cities and towns results in a random population sample. For the purposes of the creation of the CHIP sample, households were selected randomly from provinces organized along the geographic distribution of the national population. Accordingly, the CHIP urban sample is regarded as a self-weighted sample. The 2002 urban sample covers 12 provinces with sampling units from 77 different cities. There are 20,632 persons in sampled urban households. In this survey, respondents are asked whether they have no symptoms, minor symptoms not requiring help, or major symptoms requiring help of eight different types of ailments. The eight range from visual impairments to mental illness.

Demographics and Disability in China

According to the two national surveys, NSSD and CHIPs, the number of persons with disabilities increased from 51.6 million (4.9 percent of the total population) in 1987 (Statistics Bureau of China, 1987), to 83.0 million (6.34 percent of the total population) in 2006. Among persons with disabilities who were identified in 2006, 4.66 percent were under 14 years of age, 42.1 percent were between 15 and 59, 7.98 were between 60 and 64, and 45.26 were over 65 years old. In other words, the largest group of

those with disabilities was the post-retirement group. Also according to the latest NSSD, 51.55 percent were male and 48.45 percent female; 24.96 percent lived in urban areas and 75.04 percent in rural areas. In 2006, the disability rates in urban and rural areas were about 3.6 percent and 8.4 percent, respectively, the latter being more than twice the former. In addition, seven provinces had a disability rate over 7 percent in 2006. They were: Jilin, Hebei, Henan, Sichuan, Guangxi, Xizang, and Gansu, more than half of them having considerable populations of Chinese ethnic minorities (Statistics Bureau of China, 2006).

Employment and Income

The Chinese government's employment policies for persons with disabilities have been adjusted from time to time during the past decades. Such adjustments have shifted the policy approach from concentration to dispersion and are related to China's transition from a planned economy to a market economy, as argued by McCabe and Wu (2009) and Huang, Guo, and Bricout (2009). Yet the effectiveness of the policies at an implementation level is debatable. Fisher and Li (2008) point out that there was a "gap between the rhetoric of Chinese law and the experience of disability policy" and a "disjuncture between Chinese disability rights policy and independent living policy implementation." Also, the lack of training for people with disabilities and employers' negative attitudes toward hiring persons with disabilities posed two problems, Hampton (2001) alleges. He contends that many companies would rather pay the fines for deliberately not hiring people with disabilities than follow the policies.

Hampton (2001) also argues that the most common job positions taken by people with disabilities are in "welfare enterprises" and in their own communities. As China transitioned to a market economy, most of these enterprises "faced cut backs or even shut downs" (Hampton, 2001). In such cases, employees with disabilities are unavoidably among the unfortunate ones who lose their jobs. In addition, Zhang and Hu (2008) describe how persons with disabilities experienced the most difficulty in the labor market and could only get lower positions and salaries. They conclude that the development of employment for people with disabilities was unbalanced among different regions and different kinds of jobs that could be done by people with different types of disability. Moreover, the attitude of persons with disabilities toward taking a job seems ambivalent. McCabe and Wu (2009) suggest that among persons with disabilities taking a job was regarded as "mutually beneficial." Yet Pierini, Pearson, and Wong (2001) describe a dilemma faced by persons with disabilities of wanting to make contact with society and fearing the assumption of responsibilities.

As for the economic status, the 2006 Survey reports that the average total income of a person with a disability in 2005 was RMB 4864 in urban areas and RMB 2260 in rural areas, both less than half of their able-bodied counterparts (Statistics Bureau of China, 2006). Liu, Zhang, and Zhang (2007) conducted an investigation of the socioeconomic status of persons with disability and found that 66.4 percent of those investigated had a monthly income below the minimum subsistence level.

In short, the literature on disability and economic status in China clearly points to a disadvantaged position for persons with disabilities. However, this is against a backdrop of policy initiatives that putatively provides affirmative benefits to persons with disabilities.

The US Context

Definition of Disability

The 2000 U.S. Census defines disability as (a) blindness, deafness, or a severe vision or hearing impairment; (b) a substantial limitation in the ability to perform basic physical activities, such as walking, climbing stairs, reaching, lifting, or carrying; (c) difficulty learning, remembering, or concentrating; or (d) difficulty dressing, bathing, or getting around inside the home (Erikson & Lee, 2005). Building on the Census definition of disability, the American Community Survey (ACS) – a recent effort to collect information at the community level during inter-Census years -- codes an individual as being disabled if the person or a proxy respondent claims: a) to be deaf or to have serious difficulty hearing; b) to be blind or to have serious difficulty seeing even when wearing glasses; c) to have serious difficulty concentrating, remembering, or making decisions because of a physical, mental, or emotional condition; d) to have serious difficulty walking or climbing stairs; e) to have difficulty dressing or bathing; or f) to have difficulty doing errands alone such as visiting a doctor's office or shopping because of a physical, mental, or emotional condition. These six conditions – referencing respondents in most instances who are five years or older -- are recoded as Hearing Disability, Visual Disability, Cognitive Disability, Ambulatory Disability, Self-care Disability, and Independent Living Disability (Erickson, et al., 2010).

The Census definition is in stark contrast to the designation available when using in the Current Population Survey, which has been conducted continuously since 1948. Sponsored jointly by the U.S. Census Bureau and the U.S. Bureau of Labor Statistics (BLS), the Current Population Survey (CPS) is the primary source of labor force statistics for the population of the United States (see <http://www.census.gov/cps/>).⁶ The CPS identifies persons who had "a health problem or a disability which prevents him/her from working or which limits the kind or amount of work." This question is followed by a follow-up question concerning the receipt of income as the result of a health problem. Respondents were not supposed to refer to short, acute illnesses (e.g., influenza) or temporary conditions (e.g., pregnancy or broken bones). One can construct from these responses an indicator of "good health" as meaning a person who is not restricted in their employment by poor health.

Still another conceptualization of disability comes from the National Institutes of Health (NIH), which defines disability as the following:

"Disability is a general term that refers to any long- or short-term reduction of a person's activity as a result of an acute or chronic condition. *Limitation of activity* refers to a long-term reduction in a person's capacity to perform the average kind

or amount of activities associated with his or her age group. *Restriction of activity* refers to particular kinds of behavior usually associated with a reduction in activity due to either long or short-term conditions. Thus limitation of activity refers to what a person is generally capable of doing, but restriction of activity ordinarily refers to a relatively short-term reduction in a person's activities below his or her normal capacity." (National Center for Health Statistics, 1988, p. 140)

Accordingly, the NIH definition of disability is broader and only imperfectly related to work behavior. The Census and the ACS definitions are more specific in detailing the specific type of limitation of one's life's activities. The CPS definition is narrower and focuses on conditions that limit employment.

Demographics of Disability

Data from the 2000 U.S. Census, the American Community Survey as well as from the Current Population Survey, all show a common demographic profile of persons with disabilities: higher disability rates for American Indians and African Americans than for white non-Hispanics, Asians or Hispanics; and higher disability rates for persons in the post-retirement ages than for persons in the working ages. For example from the 2009 American Community Survey, and among persons 21 to 64 in the non-institutionalized population, 10.4 percent of white non-Hispanics were disabled; 14.1 percent of blacks were disabled; 8.3 percent of Hispanics were disabled; 4.4 percent of Asians were disabled; and a phenomenal 19.0 percent of American Indians were disabled (Erickson, Lee & von Schrader, 2011).⁷

Employment and Income

Persons with disabilities in the United States are far less likely to be employed than are able-bodied persons. And, among those who are employed, persons with disabilities earn less than those who are able-bodied. According to estimates from the American Community Survey, in 2009 non-institutionalized persons with disabilities aged 21-64 years working full-time/full-year earned median annual earnings of \$35,000. The median annual earnings of non-institutionalized persons aged 21-64 years without a disability in the United States who were working full-time/full-year in 2009 was \$41,000. But, the vast majority of persons with disabilities in this same age group did not work. The employment rates for white males are estimated to be 41.0 percent; for white females, 33.6; for blacks, 28.7 percent; for Hispanics, 38 percent; and for Asians, 39.3 percent. Moreover, the employment rates for persons with disabilities vary by education completion. Among persons with disabilities, the employment rate was 22.8 percent for those with no high school degree; it was 33.6 percent with only a high school degree; it was 41.5 percent for those with some college; and it was 54.8 percent for college graduates. In short, earnings for full time employed/year workers are lower for persons with disabilities than for able-bodied persons, a disproportionate share of persons with disabilities are not employed, and the employment rates among persons with disabilities are highest among white males, Asians and Hispanics and are lowest among those with the least education.

Consistent with the data from the American Community Survey, the Center for an Accessible Society reports that 30 percent of working aged persons with disabilities in the United States are unemployed. They contend that a central explanation is employer discrimination:

“Part of the problem is discrimination, and part recent court rulings favoring employers in ADA lawsuits. Discrimination against people with disabilities is, unfortunately, alive and well, despite the legal prohibitions against discrimination in hiring people with disabilities. Seventy-nine percent of disabled people who are unemployed cite discrimination in the workplace and lack of transportation as major factors that prevent them from working. Studies have also shown that people with disabilities who find jobs earn less than their co-workers, and are less likely to be promoted.

Unfavorable court rulings have not been helpful, either. Research by law professor Ruth Colker of Ohio State University has shown that in the eight years after the ADA went into effect, employer-defendants prevailed in more than 93 percent of the cases decided by trial. Of the cases appealed, employers prevailed 84 percent of the time” (Center for an Accessible Society, 2009).

One cannot conclude, however, from descriptive evidence alone the underlying causes of disparities in earnings between persons with disabilities and able-bodied persons. In the next section, we present a model of earnings disparities that permits one to isolate the independent impacts of disability on earnings.

Modeling of the Effects of Disability on Earnings

Conventional economic wisdom suggests that market wages are determined by productivity. Individual human capital variables including experience, education, and training (captured conventionally by measures of age and education) are at the forefront in the determination of wages. Institutional factors (e.g. unionization) and contextual factors (such as location or local market conditions) also matter. Why might there be *group* differences in market wages? Disparities in market wages by group membership might arise because employers have tastes for discrimination (Becker, 1957) or because employers are unable to observe individual productivity-related factors (such as skills) and these unobserved factors are believed to be unequally distributed among groups (Arrow, 1998). In both instances testable hypotheses are derived wherein one can distinguish between observed factors that differentiate between groups that explain earnings gaps and unobserved factors (Darity, 1995).

What is particularly germane about disability is that although members of the group might be thought to be less productive or are believed to have different productivity characteristics than those who are not disabled, there is a wide variance in both observed and unobserved characteristics of these populations. For example, persons who are blind might excel in music or computer science. They are visibly different from

able-bodied persons, even though their work performance may be largely unaffected by their disability. Persons suffering from certain types of mental illness such as depression or schizophrenia may not appear to be different from able-bodied persons when hired – particularly early in their careers – and may well excel initially if treated. Untreated mental illness might result in adverse impacts on work behavior. This suggests that observed and unobserved disabilities may have different impacts on productivity.

Aside from discrimination in labor markets that might reduce the incomes of persons with disabilities, there is a countervailing influence of disability payments to persons who do not work. Haveman and Wolf (2001) point out that there are non-trivial work disincentives associated with disability programs that may increase non-labor income but at the expense of lowering labor income. The net impacts depend in part on the type, severity and duration of disability.

In the simplest of tests of the hypothesis that there are statistically significant differences in income, y , between persons with disabilities and able-bodied persons, one can estimate the following regression equation:

Equation 1:

$$\ln y_i = \alpha + \phi D_i + \mu_i$$

Where for the i th individual α is a constant term, μ_i is an error term, and D_i is a dichotomous variable equal to 1 if the i th wage recipient is a person with a disability and equal to 0 otherwise. We estimate the natural logarithm of wage and salary earnings, $\ln y_i$, to account for the fact that earnings are always positive for persons who work. The test of the hypothesis that there is no difference in (natural log) earnings between persons with disabilities and able-bodied persons is the test of the hypothesis that $\phi=0$.

But, economic theory suggests that there are other determinants of wage and salary income. These include j independent variables: age, education, location, gender, race and ethnicity, type of employer, health status, and when available, measures of performance. Thus, one can re-estimate equation 1 to obtain:

Equation 2:

$$\ln y_i = \sum \beta_j x_{ij} + \phi D_i + \varepsilon_i$$

where the x 's are independent factors explaining wage and salary incomes, the β 's are the effects of these factors on income, D_i is a dichotomous variable indicating whether the respondent is a person with disability or not, and ϕ is the percentage difference in income between respondents who are persons with disabilities and those who are able-bodied that is not explained by the x 's. The normal assumptions of the error term ε_i are made: identically and independently, normally distributed with zero mean and constant variance.

Generally speaking, one expects that ϕ' is less than ϕ in absolute value. In other words, without controlling for human capital or other factors, the effect of disability on earnings would be larger (in absolute value) than the effect estimated from a model that accounts for other relevant determinants of income.

Now, the model can be estimated for a subset of the population that is in good health. This model is particularly attractive because of the possible confounding influence of disability and health. In this version of the model, the estimated coefficient ϕ^h – where the superscript h denotes good health -- should vanish if there is no discrimination against persons with disabilities and ought to be smaller in absolute value than ϕ' if only because poor health could be a pretext for paying lower wages to persons with disabilities. Equation 2 only controls for the independent impacts of health and not the various interactions between health status, disability, and other factors. Thus, estimating equation 3, which is restricted to persons in good health, is akin to accounting for the interactions between health, disability, and other factors. The superscript h denotes that the variables are all measured for persons in good health.

Equation 3:

$$\ln y_i^h = \sum \beta^h_j x^h_{ij} + \phi^h D_i^h + \varepsilon_i$$

It is also possible to compare the coefficients across two different policy conditions: one country with an anti-discrimination mandate only (the case of the United States) and another country with an affirmative action mandate in addition to an anti-discrimination mandate (as is the case of China). Accordingly, we estimate equations 1, 2, and 3 for all workers separately in urban China and the United States.

Halvorsen and Palmquist (1980) and Thornton and Innes (1989) show that technically speaking ϕ should not be interpreted as the percentage difference in wage and salary incomes between workers with disability and able-bodied workers. Rather, the “exact” measure is given by $\exp(\phi)-1$, an adjustment necessitated by the fact that the underlying equation is a semi-logarithmic equation and not a linear equation. This adjustment is made in the analysis that follows our description of the data.

The Data

The Chinese Sample

The China Household Income Project (CHIP) was assisted by the General Team of Rural and Urban Surveys at the National Bureau of Statistics (NBS) that conducted fieldwork in early 2003. The sample was drawn from a larger sample used by the (NBS) in its annual household survey covering 67,000 rural and urban households, through a multi-stage random sampling. Our analysis is restricted to the urban sample, where wage and salary income information is more readily available than in the rural sample. There are 20,632 persons in sampled urban households. Of those persons, 11,217 are between

the ages of 18 and 60 with positive wage or salary incomes. The average wage and salary income for this subgroup in 2002 was RMB 8,036. For persons with disabilities, the average was RMB 5,379. For those without disabilities, the average was RMB 8,125. Thus, in urban China, there was a -33.80 percent difference between earnings of persons with disabilities and those without disabilities. In the urban sample of 18 to 60 year olds, 3.2 percent reported disabilities, as computed from the CHIPS 2002 data (Shi, 2009)

The United States Sample

The Current Population Survey (CPS) is a monthly survey of labor force characteristics. It samples the civilian non-institutional population 16 years and older and contains a rotating sample of 60,000 households. The annual demographic survey (March Supplement) contains detailed information on education, family status, disability, and health and related measures along with annual wage and salary income. For comparability with the Chinese data, we have restricted the data set to persons 18 to 60 with positive wage and salary incomes. A total of 71,964 persons met these criteria in 2002. The average wage and salary income was \$39,271. For persons with disabilities, the average was \$24,582. For those without disabilities, the average was \$39,587. Thus, in the urban United States, there was a -37.90 percentage difference between the earnings of persons with disabilities and those without disabilities, as computed from the CPS data. (King, et al. 2010).

Descriptive Statistics

Table 1 provides descriptive statistics on the two samples. In the China urban sample, restricted to working age persons 18-60, the share of persons who report disabilities is 3.2 percent. In the United States, the disability share is lower at 2.1 percent. The average age in the China sample is 40; in the US sample, it is 38. Persons with disabilities in both samples are older than able-bodied persons and the percentage difference in ages between persons with disabilities and able-bodied persons are about the same at 10 percent. In the China sample, 4.2 percent of persons are minority group members with slightly higher minority shares among persons with disabilities as compared to the able-bodied. In the US sample, 32.5 percent are non-white or Hispanic. But the distribution by race/ethnicity differs greatly among groups. For example, there is a larger share of Asians and Hispanics among the able-bodied than among persons with disabilities. There is a larger share of blacks and American Indians among those with disabilities than the able-bodied. Gender distributions differ between the China and US samples also. In the China sample, there are no gender differences in the percentages of persons with disabilities and the able-bodied. In the US sample, 51.3 percent of persons with disabilities are female, while 46.7 percent of able-bodied persons are female. In both the China and US samples, persons with disabilities are less educated than are able-bodied persons; are more likely to be in poor health, and to be household heads. Contrary to evidence from other literature, Table 1 shows a lower share of employment in the public sector for persons with disabilities than able-bodied persons in China; in the US there is no difference in public sector employment shares between the two populations.

Health Status

Both the CHIPS data and the CPS data make sharp distinctions between poor health and disability. In the CHIPS data, persons are asked – apart from the disability questions – to compare their health to persons of the same age. Possible responses are: very healthy, healthy, just so-so, bad or very bad. We have coded “bad health” to reflect responses “bad” or “very bad.” All other values are coded as “good health.” In the CPS sample, persons are asked to indicate whether they have any health limitations that affect their ability to work. Those who respond affirmatively are deemed to have “bad health.” Others are defined as in “good health.” Clearly, from Table 1, we see that not all persons who are disabled are in bad health, even though the incidence of self-reported bad health is higher about persons who are disabled than among able-bodied persons. About five percent of persons in both samples report being in bad health. Among persons who are disabled, 42.2 and 38.5 percent report being in bad health in China and the USA respectively. Among able-bodied persons, the rates are 3.7 percent and 4.7 percent. In short, although there are clear differences in the rates of self-reported bad health between persons with disabilities and able-bodied persons, the vast majority of persons with disabilities in both samples report being in good health. These rates, remarkably similar in China and the USA, confirm that the “bad health” variable is not tautologically the same as the disability variable in the data sets.

Table 1:

Descriptive Statistics in the China and US Samples								
	CHINA				UNITED STATES			
	Total	Persons with Disabilities	Able-Bodied Persons	Percentage difference	Total	Persons with Disabilities	Able-Bodied Persons	Percentage difference
Persons with Disabilities	0.032				0.021			
AGE	40	44	40	10.00%	38	42	38	10.30%
Non-Han	0.042	0.046	0.042	9.52%				
White-Non Hispanic					0.675	0.730	0.674	8.34%
Hispanic					0.143	0.091	0.144	-36.63%
Black/Negro Non Hispanic					0.122	0.131	0.122	7.02%
American Indian/Aleut/Eskimo Non Hispanic					0.006	0.020	0.006	216.77%
Asian or Pacific Islander Non Hispanic					0.053	0.028	0.054	-47.50%
FEMALE	0.510	0.509	0.510	-0.20%	0.468	0.513	0.467	9.89%
EDUCATION								
Less than High School	0.322	0.545	0.314	73.57%	0.107	0.129	0.107	20.52%
High School or Some College	0.583	0.409	0.588	-30.44%	0.580	0.671	0.578	16.11%
Bachelor's Degree	0.088	0.045	0.091	-50.55%	0.212	0.137	0.214	-35.95%
More than College	0.006	/	0.006		0.100	0.063	0.101	-37.71%
BAD HEALTH	0.050	0.422	0.037	1040.54%	0.054	0.385	0.047	712.92%
EMPLOYED IN PUBLIC SECTOR	0.445	0.269	0.451	-40.35%	0.150	0.149	0.150	-0.87%
HOUSEHOLD HEAD	0.396	0.411	0.395	4.05%	0.514	0.611	0.512	19.40%
2002 CHIPS URBAN SAMPLE, AGES 18-60					2002 CPS URBAN SAMPLE, AGES 18-60			

Table 2 reports the differences in wage and salary incomes across different characteristics of workers. The percentage gap in earnings between persons with disabilities and able-bodied persons is lower in the China sample than it is in the US sample. Earnings are lower for persons with disabilities than for the able-bodied across all age groups, for both male and female, for household heads and non-heads, and for those in good health and in bad health in the China sample as well as in the US sample. Notably different, however, are the earnings gaps by education level in the China sample vs. the US sample. In the US sample, earnings are lower in each educational category for persons with disabilities than for able-bodied persons. However, in the China sample, college graduates with disabilities actually earn more than their able-bodied counterparts. This finding is consistent with an affirmative action policy that favors the better educated among persons with disabilities.

Table 2:

Average Wage and Salary Income, China and USA 2002								
	CHINA (Yuan)				UNITED STATES (Dollars)			
	Total	Persons with Disabilities	Able Bodied Persons	Percentage difference	Total	Persons with Disabilities	Able Bodied Persons	Percentage difference
Total	8,036	5,379	8,125	-33.80%	39,271	24,582	39,587	-37.90%
Race/Ethnicity								
HAN (White Non-Hispanic)	8,041	5,325	8,130	-34.50%	43,828	26,653	44,228	-39.74%
Non-Han (Hispanic)	7,930	5,671	8,014	-29.23%	25,583	18,226	25,684	-29.04%
Black/Negro Non Hispanic					29,321	19,357	29,551	-34.49%
American Indian/Aleut/Eskimo Non Hispanic					31,041	17,204	31,983	-46.21%
Asian or Pacific Islander Non Hispanic					42,155	20,963	42,395	-50.55%
Gender								
Male	9,814	6,035	9,941	-39.29%	47,448	26,381	47,862	-44.88%
Female	6,330	4,748	6,383	-25.61%	29,976	22,876	30,144	-24.11%
Education								
Less than High School	4,995	2,813	5,120	-45.06%	18,786	12,731	18,943	-32.79%
High School or Some College	8,935	7,584	8,967	-15.42%	30,921	21,821	31,148	-29.94%
Bachelor's Degree	12,790	15,724	12,740	23.42%	54,322	38,542	54,539	-29.33%
More than College	17,856	/	17,882		77,651	47,915	78,049	-38.61%
Age								
less than 30	4,125	3,280	4,142	-20.81%	22,473	14,950	22,568	-33.75%
[30,45)	9,734	7,272	9,800	-25.80%	42,828	25,006	43,189	-42.10%
Greater than 45	8,023	4,599	8,189	-43.84%	48,677	27,577	49,325	-44.09%
Health								
Good Health	8,148	6,795	8,175	-16.88%	39,870	27,300	40,044	-31.83%
Bad health	6,019	3,438	6,926	-50.36%	28,878	20,242	30,387	-33.39%
	2002 CHIPS, Urban Sample, Ages 18-60				CPS, Urban Sample, Ages 18-60			

Regression Results

Table 3 reports the results of estimating equations 1 and 2 for all workers and equation 3 for healthy workers (i.e. those who are in good health). The table shows the results separately for China and the United States. The first row in the table reports the estimated coefficients on ϕ , ϕ^d , and ϕ^h , the effects of disability status on log-earnings. All estimates are negative and statistically significant at the 1 percent level. In both the China and US samples, earnings increase with age and education, are higher for household heads, and lower for females and persons in poor health. In the US sample, racial and ethnic minorities earn less than non-minorities; in the China sample there are no statistically significant differences in earnings between urban minorities and Han, the majority group.

Table 3:

ESTIMATED COEFFICIENTS IN LOG-LINEAR MODEL OF WAGE AND SALARY INCOME, 2002						
	CHINA URBAN SAMPLE			USA Urban Sample		
	(1)	(2)	(3)	(1)	(2)	(3)
Disabled	-0.3811 (0.000)**	-0.1829 (0.005)**	-0.2147 (0.007)**	-0.799 (0.000)**	-0.5616 (0.000)**	-0.5189 (0.000)**
Age		0.0987 (0.000)**	0.0998 (0.000)**		0.1472 (0.000)**	0.1506 (0.000)**
Age squared		-0.0012 (0.000)**	-0.0012 (0.000)**		-0.0016 (0.000)**	-0.0016 (0.000)**
High School or Some College		0.3732 (0.000)**	0.3682 (0.000)**		0.4178 (0.000)**	0.4144 (0.000)**
Bachelor's Degree		0.6952 (0.000)**	0.6837 (0.000)**		0.8429 (0.000)**	0.8412 (0.000)**
More than College		0.8621 (0.000)**	0.853 (0.000)**		1.0978 (0.000)**	1.0928 (0.000)**
Household Head		0.168 (0.000)**	0.1711 (0.000)**		0.1465 (0.000)**	0.1454 (0.000)**
Public Sector Employment		0.6048 (0.000)**	0.5973 (0.000)**		-0.0396 (0.000)**	-0.046 (0.000)**
Bad Health		-0.0913 (0.036)*	/		-0.2413 (0.000)**	/
Female		-0.2333 (0.000)**	-0.239 (0.000)**		-0.4191 (0.000)**	-0.4194 (0.000)**
Minority(Non-Han)		0.0068 (0.866)	-0.0043 (0.916)			
Hispanic					-0.1304 (0.000)**	-0.1339 (0.000)**
Black/Negro Non Hispanic					-0.1714 (0.000)**	-0.1683 (0.000)**
American Indian/Aleut/Eskimo Non Hispanic					-0.1285 (0.003)**	-0.135 (0.002)**
Asian or Pacific Islander Non Hispanic					-0.1325 (0.000)**	-0.1371 (0.000)**
Constant	8.9596 (0.000)**	6.7255 (0.000)**	6.7132 (0.000)**	10.086 (0.000)**	6.7503 (0.000)**	6.7029 (0.000)**
Observations	11217	11186	10692	71964	67470	63867
R-square	0.004	0.314	0.3146	0.014	0.3262	0.3288

Robust p values in parentheses; province/state dummies included in equations (2) and (3)

*** significant at 5%; ** significant at 1%**

Finally, whereas in the US sample earnings are lower for workers in the public sector, in the China sample, public sector workers and those in state-owned enterprises earn more than workers elsewhere.

Table 4 gathers the results of estimating ϕ for the various models and displays both ϕ , the estimated coefficient on disability, and $\exp(\phi)-1$, the exact measure of the percentage difference in earnings due to disability.

Table 4

Comparison of Percentage Differences in Wage and Salary Incomes Due to Disability, United States vs China						
	United States		China		United States/China	
	ϕ	$\exp(\phi)-1$	ϕ	$\exp(\phi)-1$	ϕ	$\exp(\phi)-1$
(1) Unadjusted	-79.90%	-55.02%	-38.11%	-31.69%	2.10	1.74
(2) Adjusted	-56.16%	-42.97%	-18.29%	-16.71%	3.07	2.57
(3) Adjusted, Healthy Sample	-51.89%	-40.48%	-21.47%	-19.32%	2.42	2.10

Note: The unadjusted estimates of ϕ are obtained from a log-linear regression of wage and salary income on disability status. The estimate $\exp(\phi)-1$ is the "exact" measure of the percentage difference in earnings due to disability status; the adjusted estimates of ϕ and $\exp(\phi)-1$ include in the regressions, age, age-square, education, gender, race/ethnicity, health status, type of employment, and province/state dummies. All estimates are statistically significant at the 5 percent level.

Implications

There are negative and statistically significant impacts of disability on wage and salary earnings in all models and in both the US and China samples. However, the magnitude of these adverse impacts of disability on earnings is consistently larger in the United States than in China. Without controls for any factors at all, the adverse impacts of disability status on earnings are larger than they are when one controls for human capital and other relevant factors. For example, the estimated percentage difference in earnings between workers with disability and able-bodied workers in the United States without controls is -55.02 percent. Once one controls for relevant factors, the percentage difference drops (in absolute value) to -42.97 percent. In the China data set, the unadjusted difference is -31.69 percent. When one controls for human capital and other relevant factors the difference drops to -16.75 percent. The last column of table 4 reports the ratios of the United States to China estimates of the effects of disability on earnings. The ratio ranges from 1.74 to 3. The adverse impacts of disability on earnings are more than twice as large in the United States as in China controlling for relevant determinants of earnings.

In the healthy sample, the negative impacts of disability are more than twice as large in the United States as they are in China. The estimated effects are smaller (in absolute value) for healthy persons than for all workers in the United States. The exact measure of the percentage difference in earnings due to disability, controlling for relevant factors, is -40.48 percent in the healthy sample as compared to -42.97 among all workers in the United States, a small but non-trivial difference. In China, however, the percentage

gap in earnings due to disability is larger in the healthy sample as compared to the overall sample, with exact measures equal to -19.28 percent vs. -16.75 percent. The result is that the ratio of the disability effect on earnings in the United States to the disability effect on earnings in China is lower among healthy workers than it is among all workers. Yet, even among healthy workers, the ratio exceeds two. In short, the negative impacts of disability on earnings are larger in the United States than they are in China even among healthy workers.

Summary and Conclusions

China is unique among emerging international economic powers in the sense that it provides explicit affirmative action for persons with disabilities. The requirement in China that both state-owned enterprises and private companies employ a certain proportion of workers with disabilities is in stark contrast to the United States where federal policy mandates that employers not discriminate against persons with disabilities in hiring, promotions, wages, or other aspects of the work experience. Indeed, ADA's requirement that employees not be required to reveal their disability during a job interview or employment application process can be viewed strictly as an anti-discrimination mechanism as opposed to the affirmative action *requirement* in China that firms hire workers with disabilities.

Our results show that there are measureable differences in the adverse impacts of disability between the urban, working age samples in the United States and in China. The immediate interpretation of these results is that reductions in earnings due to disability depend critically upon the institutional and legal context in which disability policy is set. Since we have controlled for exactly the same factors in the models estimated for both the US and China, and since the samples are comparable with respect to age and urban location, the differing sizes of the coefficients on the disability effect can be interpreted as attributable to differences in policies between China and the US. The models control for differences in province or state, but they do not control for nuanced differences in the definitions of disability.

Kohrman (2003) notes that the official statistics on disability in China are suspect, because they are collected in a highly political environment where the goal is to produce a disability rate that is neither too high – a possible challenge to the central government -- nor too low, wherein the data will not be believable to international observers. The CHIPs data seem to overcome many of the objections of Kohrman. The data set is not designed to measure disability and, like the Current Population Survey, the disability rates are realistically low among persons who are employed. The resulting disability rates in urban China are remarkably similar to the disability rates among working age persons in the United States. The relatively low levels of disability rates observed in the CPS data of persons who have wage and salary incomes is consistent with the work disincentive effects of disability insurance reported widely (Acemoglu & Angrist, 2001; Haveman & Wolf, 2000) in the economics literature.⁸

We have resisted using the term “discrimination” to describe our estimated impacts of disability on earnings. In a formal test of discrimination against persons with disabilities prior to ADA, DeLeire (2001) estimated that only a small portion of the earnings gap between persons with disabilities and able-bodied persons can be attributed to discrimination, in the sense that identically situated persons are treated unequally. He contends that earnings gaps widened after ADA’s passage and that employment of persons with disabilities declined. The estimation procedure employed in this paper does not permit us to distinguish between gaps in earnings due to unequal treatment of identically situated individuals and differences in productivity between persons with disabilities and able-bodied persons. However, the fact that we still obtain a sizeable disparity in earnings even among persons who report good health in 2002 suggests that disability status exerts a non-trivial impact on wage and salary earnings.

Absent empirical evidence to the contrary, the central conclusion from this paper is that the adverse impacts of disability on earnings of working age adults in urban areas are smaller in China than in the USA. This perhaps surprising conclusion comes about despite the widespread perception that persons with disabilities in China have fewer opportunities and are more restricted in their access to schools, workplaces, and public accommodations than persons with disabilities in the United States. Visitors to the 2008 Beijing Olympics routinely complained about lack of access and physical barriers preventing many persons with disabilities from navigating successfully around the city. Another example is the case of hearing impaired and deaf children who are unable to complete school beyond the primary grades due to a lack of access to facilities that would help them integrate into mainstream classrooms. Because the Chinese language relies heavily on tones, lip reading is nearly impossible. And Chinese sign language is not widely understood outside of large urban areas. In the United States, by way of contrast, most public buildings must meet stringent accessibility standards and American Sign Language is widely understood in diverse quarters. Most major television shows are captioned for the deaf and hearing impaired and there is an extensive system for relaying telephone calls between hearing and deaf or hearing impaired customers, services conspicuously absent even in major Chinese cities. Thus, all things considered, one would expect larger negative impacts of disability on earnings in China than in the United States. That this is not the case, we contend, is due to labor market policy differences between the two countries. In one area that matters, wage differentials, China’s affirmative action policies produce better results for persons with disabilities than the anti-discrimination policies of the USA.

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Acknowledgements

We wish to thank Professor Li Shi of Beijing Normal University for providing the data and engaging in detailed discussions about the strengths and limitations of the CHIPS data. We also wish to thank participants in the Inequality in China Conference, held at Beijing Normal University, May 2009. Research assistance was provided by Blanca Monter and Juan Cardenas of the University of Minnesota and Liu Shuo of Hong Kong University of Technology and Science. An initial version of this research was presented at the Beijing Headquarters of Handicap International. Special thanks to Jennifer McLean for initiating the contact with Handicap International. We are grateful for the insightful comments from the workshop participants. Finally, we thank Wanling Qu for the generous hospitality of the University of Minnesota Beijing Office.

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Endnotes

¹ "Title I requires employers with 15 or more employees to provide qualified individuals with disabilities an equal opportunity to benefit from the full range of employment-related opportunities available to others. For example, it prohibits discrimination in recruitment, hiring, promotions, training, pay, social activities, and other privileges of employment. It restricts questions that can be asked about an applicant's disability before a job offer is made, and it requires that employers make reasonable accommodation to the known physical or mental limitations of otherwise qualified individuals with disabilities, unless it results in undue hardship." A Guide to Disability Rights Laws, U.S. Department of Justice, Civil Rights Division Disability Rights Section, September 2005. www.ada.gov/cguide.htm, (downloaded, August 5, 2010).

² "The Government has established a quota system that requires all public and private employers to reserve no less than 1.5% of job opportunities for persons with disabilities, in accordance with specific regulations established by local provincial governments." International Labor Organization, Facts on People with Disabilities in China www.ilo.org/public/english/region/asro/beijing/.../disabilities.pdf (downloaded, August 5, 2010)

"The right to work is guaranteed by the law in China, which states that, 'No discrimination shall be practiced against disabled persons in employment, engagement, status regularization, promotion, determining technical or professional titles, payroll for labor, welfare, labor insurance or in other aspects.' Employers in China, such as state-run welfare enterprises, should apparently not deny people with disabilities employment." Overview of Disability in China, March 16, 2010, www.disabled-world.com/news/asia/china/disability-china.php, (downloaded, August 5, 2010)

"Law on Protection of Disability" (中华人民共和国残疾人保障法) was enacted in 1991. Article 30 in this law points out that "Government departments, institutions, organizations, enterprises and collectives in urban or rural should employ the disabled according to some certain proportion". (第三十条指出: "机关、团体、企业事业组织、城乡集体经济组织, 应当按一定比例安排残疾人就业, 并为其选择适当的工种和岗位".) In the original law, there is no specific proportion mentioned.

Thereafter, "Temporary Management Stipulation on the Disabled Employment Security Foundation" (《残疾人就业保障金管理暂行规定》) was enacted in 1995. Article 2 in this stipulation says that based on Law on Protection of Disability, Provinces, Autonomous Regions and municipalities should collect funds for those units did not employ a certain proportion disabled.

(“保障金”是指在实施分散按比例安排残疾人就业的地区, 凡安排残疾人达不到省、自治区、直辖

市人民政府规定比例的机关、团体、企业事业单位和城乡集体经济组织，根据地方有关法规的规定，按照年度差额人数和上年度本地区职工年平均工资计算交纳用于残疾人就业的专项资金。“保障金”按属地原则交纳，中央部门所属单位按照所在地地方法规的有关规定办理。) The proportion is not specifically stated in this law. The precise proportion appears to vary by province prior to 2007. For example, in Guangdong Province the proportion was 1.5 percent. But in Beijing it was 1.7 percent. However, the latest version of the law,

《广东省分散按比例安排残疾人就业办法》(广东省第九届人民代表大会常务委员会(第89号公告))，2000年7月28日广东省第九届人民代表大会常务委员第十九次会议通过。

(“Ways on Employing the Disabled According to Proportion in Guangdong Province”, (The Ninth People’s Congress Standing Committee of Guangdong Province (the 89th Public Notice)) was authorized by The Ninth People’s Congress Standing Committee of Guangdong Province on July 28th 2000.

《北京市按比例安排残疾人就业办法》(北京市人民政府令(1994年第10号))，1994年5月13日经北京市人民政府常务会第32次会议通过。

“Ways on Employing the Disabled According to Proportion in Beijing”, (Mandate of People’s Government of Beijing (the 10th 1994)) was authorized by the 32nd Executive Council of People’s Government of Beijing on May 13th 1994.)

“Regulation on Employment for Disability”(《残疾人就业条例》) enacted in 2007 stipulates a disability hiring mandate of 1.5 percent. . Prior to 2007 and for the provinces used in the analysis of this paper, the mandates were: Beijing 1.7% (since 1994), Shanxi: 1.5% (since 1999), Liaoning: 1.7% (since 1997), Jiangsu: 1.5% (since 1997), Anhui: 1.5% (since 2004), Henan: 1.5% (since 2005), Hubei: 1.5% (since 1998), Guangdong: 1.5% (since 2000), Chongqing: 1.5% (Since 2004), Sichuan: 1.5% (since 1997), Yunnan: 1.5% (since 1997), and Gansu: 1.5% (since 1997).

³ U.S. Dept. of Health and Human Services, National Center for Health Statistics. NATIONAL HEALTH INTERVIEW SURVEY, 2000 [Computer file]. 2nd ICPSR version. Hyattsville, MD: U.S. Dept. of Health and Human Services, National Center for Health Statistics [producer], 2000. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2002. doi:10.3886/ICPSR03381. <http://www.icpsr.umich.edu/cgi-bin/SDA/ICPSR/hsda?nacda+03381-0003>

⁴ Erickson and Lee, 2005.

⁵ The question asked in the rural questionnaire is:

是否有残疾或智障?

Which translates roughly to: *Do you suffer from deformity or amnesia?* An alternative translation is: *Do you suffer from disability or mental illness or disability?*

In the urban questionnaire, a similar question is posed:

您是否具有以下残疾或虚弱的身体特征?

This translates to: *Do you have the body characteristics of deformity or debility?* An alternative translation is: *Do you have the following disability or weakness of the physical characteristics?* Urban respondents are then asked eight specific disability-related questions with three possible answers: (1) not at all, (2) minor symptoms and without any assistance, and (3) serious symptoms or needs assistance. The eight additional disability questions are:

Question 1: physical disability or Hemiplegia

(身体残疾或偏瘫)

Question 2: visually impaired

(视力障碍)

Question 3: hearing impaired

(听说障碍)

Question 4: mental illness

(精神类疾病)

Question 5: mental disability

(智力障碍)

Question 6: infirmity

(体弱多病)

Question 7: chronic ailment or complaint

(慢性病)

Question 8: other disability

(其他残障)

A person is defined as being disabled if, in the urban questionnaire, the response to Questions 1, 4, 5, or 8 denotes minor or serious symptoms with or without the need for assistance; or the response to Questions 2, 3, 6, or 7 denotes serious symptoms and needs assistance; or if the response to the disability question in the rural questionnaire is “yes.”

⁶ The CPS consists of approximately 60,000 occupied households. The CPS sample consists of independent samples in each of the 50 states and the District of Columbia. There are 2,025 (primary sampling units (PSUs)—most of which comprise a metropolitan area, a large county, or a group of smaller counties).

⁷ These statistics were calculated by the Cornell University Employment and Disability Institute using the U.S. Census Bureau's 2009 American Community Survey (ACS) Public Use Microdata Sample (PUMS) data. Erickson, W., Lee, C., von Schrader, S. (2010). Disability Statistics from the 2009 American Community Survey (ACS). Ithaca, NY: Cornell University Rehabilitation Research and Training Center on Disability Demographics and Statistics (StatsRRTC). Retrieved Nov 23, 2011 from www.disabilitystatistics.org. The authors note the following: *Caution should be used when interpreting a statistic based on small base populations or when the confidence interval is large.* Readers should consult the original reference for the sample sizes and confidence intervals for the statistics reported.

⁸ In addition to the work disincentive effect of disability insurance income, Acemoglu and Angrist (2001) and DeLeire (2000) report evidence of work disincentive effects of ADA itself.

