The Labor Market Effects of Disability Hiring Quotas*

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Abstract

People with disabilities are underemployed across the world. To increase their representation, more than 100 countries have established quota regulations requiring firms to hire people with disabilities. This paper studies the labor market consequences of enforcing modest disability hiring quotas. Using the introduction of a reform in Brazil that enhanced enforcement of a new hiring quota regulation, my market-level analysis finds that people with disabilities in local labor markets more exposed to the reform experienced larger increases in employment and earnings. Leveraging variation in enforcement across firms, I document three key margins along which firms respond to the quota scheme. First, firms hire more workers with disabilities into low-paying jobs. Second, workers with disabilities experience reduced wage growth. Third, the quota also does not come at a cost to workers without disabilities in terms of wages or employment, or to firms in terms of closure. Through the lens of a simple model, I show that the policy generates aggregate welfare gains. My findings support that, in labor markets characterized by discrimination in hiring, mandating modest increases in employment for the disadvantaged can promote redistribution and improve welfare.

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1 Introduction

More than one billion people, around 16 percent of the population, live with some form of disability worldwide, constituting one of the fastest-growing underrepresented groups (WHO, 2022). Yet, in most countries, their unemployment rates are among the highest, at least twice the rate of the general population (UN, 2018). Due to firms' unwillingness to hire people with disabilities, even those who can work, policies to boost the demand for these workers are as pivotal as social insurance programs.[1] Implemented in more than 100 countries (see Figure 1), disability hiring quotas—whose origin dates back to World War I when thousands of people were left disabled—are some of the most widespread policy levers available to reduce the unemployment rates and the fiscal burden of social insurance (ILO, 2019).

This paper studies the implications of enforcing disability hiring quotas for firms and workers. Economists and policymakers have long discussed the merits of affirmative action hiring quotas for disadvantaged groups. In competitive labor markets, the conventional wisdom is that hiring quotas can increase earnings of the disadvantaged group at a potential cost of displacing the non-disadvantaged and reducing firm profits (Welch, 1976; Leonard, 1984; Griffin, 1992; Coate and Loury, 1993). Under these assumptions, the gains for the disadvantaged may be offset by larger welfare losses to other agents. Recent literature, however, has documented extensive evidence of imperfect competition and frictions, including discrimination, in the labor market. In such labor markets, firms may be inefficiently small in equilibrium, and hiring quotas may lead to efficient increases in employment and redistribute economic rents to the disadvantaged (Holzer and Neumark, 2000).

Despite the extensive coverage of hiring quotas around the world, comprehensive assessments of their labor market impacts are exceedingly scarce. There are at least two main reasons why investigating their consequences empirically, including for other disadvantaged groups, has been difficult. One reason is the limited availability of linked data both containing information on firms who are (or not) under quota regulations and identifying individuals from targeted and non-targeted groups. Second, even when such data are available, the contentious nature of affirmative action and the lack of regulatory incentives in the private sector have made most hiring quota regulations toothless. This has also led governments to

[1] Non-discriminatory factors, such as work disincentives from social insurance, transportation barriers, lack of awareness of disability issues, and lower education levels, contribute to this scenario. Nonetheless, growing evidence from experimental and observational studies shows that employers are less likely to hire people with disabilities (Baldwin and Johnson, 1994; Ameri et al., 2018).

introduce reforms for stricter enforcement (ILO, 2019).

This paper overcomes these challenges by exploiting several features of the Brazilian setting. First, the country has a disability hiring quota policy and an enforcement tool. The hiring quota regulation establishes that firms with at least 100 employees must fill a minimum of 2 percent of their positions with people with disabilities. Labor inspections are the main enforcement tool. Once inspected and found to be delinquent, firms have a grace period to meet the mandated share or face a heavy fine. Features of the regulation and enforcement structures, along with the high frequency of inspections, create useful quasi-experimental variations for identification. Second, the availability of data with detailed information on people with disabilities, including the type of disability, education, hours of work, and occupation, provides a rare opportunity to overcome the perennial dearth of data that has long challenged the literature. Third, the large size of the country and its high disability prevalence bring statistical advantages when workers with disabilities are vastly underrepresented in the labor market. Fourth, the limited coverage of social insurance for people with disabilities implies that access to disability insurance programs, one often-hypothesized cause of low employment rates, is an unlikely key driver of disability inequality.

In the first part of this paper, I quantify the aggregate impacts of enforcing hiring quotas across local labor markets. I use Census data covering the entire population and exploit the introduction of a new reform during the 2000s, which established the quota regulation and determined inspections as the main tool to enforce compliance. Along with the timing variation from the reform, I use geographic variation in the intensity of potential demand for workers with disabilities and enforcement of labor regulations. Specifically, I exploit the interaction between pre-reform firm size distribution and enforcement capacity as the source of cross-sectional variation in exposure to the reform. Pre-reform size distribution predicts differential potential demand for people with disabilities induced by the regulation. Enforcement capacity is proxied by the driving distance to the labor office.

My market-level results indicate that people with disabilities in local labor markets more exposed to the reform experience larger gains in employment and earnings. I document that the people with disabilities from more exposed local labor markets, like the cities of São Paulo or Rio de Janeiro, are 1.1 percentage points, or about 10 percent, more likely to become employed in the formal sector ten years after the reform. Their average earnings also increase. I also find no evidence that people without disabilities and workers from

the informal sector are affected. The aggregate results, albeit informative, are limited in showing how firms adjust to the mandated employment. In light of frictions in the labor market, understanding the reallocation of firm activities in the cross-section of firms is key to quantifying the policy incidence.

The second part of my paper closely examines adjustments within firms. My context permits an event study difference-in-differences design because, once inspected, firms may be assessed for compliance with labor regulations, including but not limited to disability quota regulation. I compare how labor market outcomes evolve for inspected firms with pre-inspection employment either above or below the hiring cutoff of 100 workers around the time of inspection. The estimation sample consists of the universe of all firms that were inspected, mitigating concerns related to selection into inspections. The key variation is that only firms with at least 100 employees may be under the disability hiring quota. I show that firms both above and below the mandatory cutoff exhibit similar levels and trends in outcomes before the inspection.

Using the universe of inspected firms linked to the matched employer-employee data, I document an increase in employment among people with disabilities following inspections. On the extensive margin, firms under the quota regulation, on average, are 8 percentage points more likely to hire an employee with disabilities. On the intensive margin, these firms experience an increase of around 50 percent in the total number of employees with disabilities. The vast majority of the new hires are concentrated in low-paying occupations and have milder disabilities, such as physical or hearing disabilities. At the same time, there is no evidence that employment of people without disabilities declines. I also do not find evidence that firms are more likely to exit the formal sector or experience a decrease in average wages, both imperfect proxies for profits.

Turning to workers' outcomes, I show that workers with disabilities, rather than those without disabilities, are affected. I find evidence of reduced wage growth of around 6 percent for workers with disabilities at the firms under disability hiring quotas. There are no discernible impacts on wage growth for workers without disabilities, even for those with similar characteristics as workers with disabilities. These findings point to relevant distributional consequences: Although the policy results in an increased representation of workers from the target group, it may also exacerbate workplace inequality in pay between groups.

What can explain the lower wage growth for workers with disabilities? I shed light on

mechanisms by complementing the administrative data with an original survey conducted with human resources executives and personnel. I argue that several pieces of evidence are consistent with a dynamic statistical discrimination model, in which firms observe signals to infer workers' skills for task assignments and promotions, and are less able to interpret signals of workers from a minority group. Affirmative action quotas loosen hiring standards in recruitment and reduce the average skill of the disabled group, making their signals more difficult to interpret. Consistent with discrimination being more relevant for workers with disabilities with weaker signals of their skills, I show that those without a high school diploma and in jobs with fewer interpersonal relationships drive the wage growth slowdown. I also find no support for irreversible fixed costs, compensating differentials, and retaliation due to whistleblowing as alternative explanations.

In the third part of the paper, I evaluate the implications of my findings for aggregate welfare. I outline a simple model of enforcement of disability hiring quotas under imperfect compliance to provide an assessment of the welfare effects. My model characterizes the changes in profits, surplus of workers with disabilities, and fiscal revenue following an inspection. I show that the effect on profits depends on the wedge between marginal revenue products of labor and wages. To overcome the lack of estimates of the marginal revenue product of workers with disabilities in the literature, I propose a discrete choice framework for the decision to comply with the hiring quota following inspections. I find that the data rejects that marginal worker with disabilities hired under the quota has a marginal revenue product lower than their wages. Using a sufficient statistics approach, I also document that increased employment of people with disabilities results in gains in their surplus and fiscal revenue, yielding aggregate welfare gains. Conceptually, these results are consistent with a labor market under imperfect competition characterized by discrimination at the hiring level. This is in line with my experimental survey evidence that firms are 22.2 percent less likely to express interest in hiring a candidate with disabilities relative to a similar candidate without disabilities. In such a labor market, a modest rise in mandated employment can achieve redistribution without harming overall welfare.

This paper contributes to several lines of research. It speaks to a large literature, theoretical and empirical, studying the consequences of affirmative action hiring quotas in labor markets (Welch, 1976; Lundberg, 1991; Coate and Loury, 1993; Fang and Moro, 2011). Previous studies have focused on the redistribution effects, indicating positive or neutral impacts

on the employment of minority groups, including people with disabilities (Miller and Segal, 2012; Lalive et al., 2013; Peck, 2017; Miller, 2017; Mori and Sakamoto, 2018; Prakash, 2020).[2] My contribution is threefold. First, I contribute to this literature by leveraging unusually rich administrative data and new quasi-experimental research designs to provide novel evidence of the market-level impacts across local labor markets. Second, relative to past literature, I provide richer estimates of the causal impact of hiring quotas on workers' outcomes, including wages, turnover, and part-time employment. By showing evidence of heterogeneous impacts across worker groups, this work contributes to the distributional debate about the incidence of this policy. Third, I offer a new comprehensive assessment of the implications for firms and workers, allowing me to speak to the consequences of enforcing hiring quotas for redistribution and efficiency.

This work also relates to the literature on the consequences of policies targeting people with disabilities. The core of this literature has focused on the supply side, such as the impacts of social insurance (e.g., disability insurance) and anti-discrimination regulations (e.g., Americans with Disabilities Act) on labor supply and consumption (DeLeire, 1997; Acemoglu and Angrist, 2001; Autor and Duggan, 2003; Maestas et al., 2013; Kostøl and Mogstad, 2014; Deshpande, 2016; Autor et al., 2019; Aizawa et al., 2024).[3] This paper differs from the prior literature in its focus on a much less studied angle: the demand side (Lalive et al., 2013; Mori and Sakamoto, 2018; de Araújo et al., 2021; Palmer and Williams, 2023; Duryea and Martínez, 2023). I bring new evidence of strong complementarities between enforcement and hiring quotas to boost the demand for workers with disabilities.[4] Enforcing modest hiring

[2]Other empirical works analyze whether AA policies in educational settings impact economic efficiency through changes in the final output (Bagde et al., 2016; Bleemer, 2022; Schaede and Mankki, 2022). In the context of leadership positions, a handful of papers have found that mandated representation of women on boards is associated with negative to neutral impacts on firm performance (Ahern and Dittmar, 2012; Matsa and Miller, 2013; Bertrand et al., 2019; Ferrari et al., 2021; Eckbo et al., 2022).

[3]A common policy among OECD countries is anti-discrimination legislation. The Americans with Disabilities Act, enacted in 1991 in the US, is the most prominent example of an anti-discrimination law aiming to provide better job opportunities, prohibit firms from discriminating based on disability, and mandate reasonable accommodations to workers. Several works indicate that the introduction of the ADA increased the costs of hiring workers with disabilities, creating incentives for firms to avoid hiring them (DeLeire, 1997; Acemoglu and Angrist, 2001). There is a large literature showing that anti-discrimination regulations do not increase employment in other contexts (Bell and Heitmueller, 2009; Lalive et al., 2013).

[4]In Brazil, on the regulation side, some works show that hiring quotas alone do not increase employment for people with disabilities (Costilla et al., 2002; de Araújo et al., 2021). On the enforcement side, several papers have also used variations in labor inspections to capture changes in the enforcement of labor regulations, including disability hiring quotas, formal registration, minimum wage, and mandated benefits (Almeida and Carneiro, 2012; Haanwinckel and Soares, 2021; Ponczek and Ulyssea, 2021; de Souza, 2023).

quotas can increase aggregate welfare, suggesting scope for demand-side policies incentivizing employers to hire from this group.

At a broader level, this paper builds on a large literature assessing the incidence of regulations. In perfectly competitive labor markets, redistributive regulations cannot be justified on efficiency grounds. Given a growing number of papers that have documented the existence of employer discrimination (Glover et al., 2017; Benson et al., 2022) and imperfectly competitive labor markets, in which firms have some power to determine wages and set inefficiently low employment levels (Card et al., 2013), recent evidence suggests that regulations have the potential to improve efficiency and achieve redistribution (Manning, 2011). Examples of price regulations in labor markets examined in the literature include payroll taxes (Saez et al., 2019), minimum wage (Harasztosi and Lindner, 2019), wage floor (Card and Cardoso, 2021), and hiring credits (Cahuc et al., 2019). Wage subsidies are perhaps another prominent example of price regulations that can create job opportunities for the disadvantaged. Most of the evidence, however, indicates that wage subsidies are ineffectual in increasing employment for disadvantaged groups due to low take-up rates (Katz, 1996; Bartik, 2001; Huttunen et al., 2013).[5] This paper focuses on a quantity regulation mandating employment for the disadvantaged. My findings indicate that, in labor markets with frictions like discrimination, enforcing modest quotas can be a promising pathway for countering the low employment of people with disabilities.

The remainder of this paper is structured as follows. Sections 2 and 3 describe the institutional context and data. Section 4 presents the aggregate impacts of enforcing the quota policy. Section 5 analyzes how firms make adjustments and potential mechanisms underlying some results. In Section 6, I discuss implications for welfare. Section 7 concludes.

2 Institutional Context

2.1 Disability Gaps in the Brazilian Labor Market

In most countries, the employment gap between people with and without disabilities is substantial, leading to high welfare dependency and poverty rates. The unemployment rates among working-age people with disabilities are at least twice the general level (ILO,

[5] In contrast to wage subsidies for the disadvantaged, some papers have shown that wage subsidies can stabilize labor demand in recessions (Neumark and Grijalva, 2017; Schoefer, 2021).

2007; Mizunoya and Mitra, 2013; UN, 2018). Non-discriminatory factors, such as work disincentives from social insurance, transportation barriers, lack of awareness of disability issues, and lower education levels, contribute to this scenario. Employers' willingness to take on people with disabilities as workers still constitutes a substantial challenge. Observational studies show that firms are less likely to hire people with disabilities (Baldwin and Johnson, 1994). Randomized audit studies point to lower employer callback rates for applicants with disabilities (Ameri et al., 2018; Bjørnshagen and Ugreninov, 2021; Bellemare et al., 2023). In Brazil, my experimental survey results demonstrate that firms are 22.2 percent less likely to express interest in hiring a candidate with disabilities than a similar candidate without disabilities. Potential workplace accommodation costs and productivity concerns do not entirely explain the employment gaps.

Until 2015, like many countries, such as Germany, Hungary, Poland, Sweden, and Turkey, Brazil adopted a medical approach to disability. Disability is defined as an impairment of a physical, mental, intellectual, or sensory nature, which, in interaction with other barriers, may hinder the full and effective participation of people with disabilities in society on equal terms relative to people without disabilities. According to the 2010 Census, 17.23 percent of working-age Brazilians aged between 25 and 54 report living with some form of disability, while 6.68 percent disclose having a severe disability.[6] Even with the challenges associated with defining disability and the lack of standardized disability statistics on a global scale, these numbers are strikingly comparable to other countries, such as New Zealand, the US, and the UK (Mitra and Yap, 2021).

Despite their high prevalence, people with disabilities are still vastly underrepresented in the labor market. Records from the 2010 Census data reveal large disability gaps among the working-age population. Table A1, Appendix A, shows that nearly 78.8 percent of people without disabilities aged between 25 and 54 are economically active. On the other hand, people with some (severe) disabilities are 4.9 (19) percentage points less likely to be economically active. Among economically active individuals, having some (severe) disability is also associated with higher unemployment rates by 4.6 (6.4) percentage points. Conditional on working, people with disabilities are more likely to be employed in the informal sector by 2.1 to 3.3 percentage points and earn about 12.8 to 20.1 percent less than those without

[6]The Census asks whether the respondent lives with severe, some, or no difficulties in each of the following activities: seeing, hearing, and walking or climbing stairs. In addition, the Census collects information on whether the individual has a permanent intellectual disability.

disabilities. These large gaps, which are not explained by differences in location, educational level, potential experience, occupation, or economic sector, illustrate substantial labor market differences *even for people with disabilities who can work.*

An unconditional cash transfer (*Benefício de Prestação Continuada*), equivalent to a monthly minimum wage (about USD 260 in 2023) is available to very poor people who have severe disabilities and do not meet household per capita income above one-quarter of the minimum wage. The transfer does not require previous contributions to social security. The coverage is quite limited: Only the very poor with severe disabilities hindering independent living and work capacity are eligible for the transfer. In 2010, less than 4 percent of people with disabilities received it, suggesting that work represents their main source of income.[7]

2.2 A New Reform During the 2000s

Heeding global efforts to reduce disability inequality, in 1999, the federal government enacted a version of the Anti-Discrimination Act (National Policy for People with Disabilities or Decree 3,298), which practically came into effect in 2000 (henceforth 2000 reform). Relevant to the paper, the Act consisted of three main features. First, it provided a legal definition for the term "disability" and a preliminary list of medical conditions to qualify for having a disability. Examples of disabilities include mobility and physical impairments (e.g., paraplegia, monoplegia, amputation or absence of a limb, limbs with congenital or acquired deformity, among others), moderate to profound hearing loss, moderate visual impairment to blindness, and selected mental disorders. Appendix A.2 contains a full list of disabilities.

Second, the Act regulated the affirmative action quota (henceforth AA quota) by mandating firms in the formal private sector with at least 100 employees to fill a minimum of 2 percent of positions with people with disabilities or individuals enrolled in a vocational rehabilitation program from the Social Security. The reserved share increases in firm size: Firms with 201 to 500 (501 to 1,000) employees must meet a quota of 3 percent (4 percent), while those with more than 1,000 employees have a quota of 5 percent.[8]

The third key element is the utilization of labor inspections as the main enforcement tool to promote compliance with the AA quota. Due to regulatory intricacies, oversight

[7] In contrast to an estimate of 45.6 million individuals reporting living with some form of disability, only 1.7 million people with disabilities received the unconditional cash transfer in August 2010.

[8] The AA quota regulation was first launched in 1991 with Law 8,213. However, the federal government only formally regulated the AA quota and its functioning after the Anti-Discrimination Act.

and monitoring of the AA quota through labor inspections only became possible after 2003, when the Ministry of Labor started to collect information on workers with disabilities in the formal sector and established administrative fines and penalties for delinquency (Thomasi et al., 2018).[9] Appendix A.3 describes the regulatory process in detail. In short, the 2000 reform—which created instruments to define disabilities, mandate reserved jobs through the AA quota regulation, and boost its compliance—represented the first legal framework aimed at increasing employment for people with disabilities.

2.3 Enforcement of Disability Hiring Quotas

The Brazilian labor market is characterized by a rigid legal structure with numerous mandated benefits to workers (e.g., minimum wage, unemployment insurance, and severance pay), high dismissal costs, and burdensome tax requirements. Imperfect compliance with labor regulations is quite common. In many cases, firms in the formal sector hire workers without fully complying with several regulations—such as payments to social security and hiring people with disabilities—or even hire informal workers "off the books" (Ulyssea, 2018).

The Ministry of Labor verifies compliance with many dimensions of labor regulations and uses labor inspections as the main enforcement tool. The enforcement capacity has a decentralized structure: Each state has its own state labor office (*delegacia*) located in the state capital, and each state may also have additional local labor offices (*subdelegacias*) in other municipalities, depending on the state's size and economic importance.[10] Inspections can be triggered by random firm audits or anonymous reports from numerous sources, such as workers, labor unions, or the prosecutor's office. In practice, most inspections are triggered by anonymous reports since most labor offices are understaffed (Almeida and Carneiro, 2012).

The technology of enforcement is straightforward. Inspectors are assigned to a specific local labor office and must travel by car to inspect firms. This generates substantial spatial variation since smaller distances to the labor office imply a higher probability of inspection and, as a result, enforcement capacity (Ponczek and Ulyssea, 2021). Once inspected, firms

[9]The first rules establishing the formal inspection procedures for the AA quota regulation (Normative Instruction SIT 20) and the administrative fines and penalties for non-compliance (*Portaria* 1,199) arose in 2001 and 2003, respectively.

[10]Brazil has 27 states, implying that there are 27 state labor offices (*delegacia*). States with low population density, such as Acre, Amapá, and Tocantins, have only one labor office (*delegacias*). More dynamic states, such as São Paulo and Minas Gerais, have at least 20 local labor offices (*subdelegacias*) besides their own state labor office (*delegacia*).

may be assessed for compliance with many dimensions of labor regulations, including formal registration, severance and overtime pay, minimum wage, and number of hours worked. The key feature, fundamental to my research design, is that *only* firms with at least 100 full-time employees may also be required to fill 2 percent of positions with workers with disabilities.[11]

Firms that fail to meet the AA quota may be notified and granted a grace period to comply with the regulation after an initial inspection. In case of continued non-compliance, a heavy fine, which typically ranges from 2.35 to 235 monthly minimum wages per missing worker, may be imposed unless the firm shows concrete evidence of effort and failure in hiring workers with disabilities.[12] To qualify for the job reserved to the AA quota, the worker needs to have a medical report containing the type of disability and its code following the International Classification of Diseases (ICD). To minimize moral hazard or fraud in the hiring process, the worker must provide consent in disclosing this information. The penalties for providing fraudulent information can be quite severe.[13]

3 Data

This paper uses three primary data sources: Data on labor inspections provided by the Ministry of Labor, the matched employer-employee records covering the entire formal sector, and the decennial Demographic Census data covering the Brazilian population.

Labor Inspections. The first source of data summarizes labor inspections conducted by the Ministry of Labor. The data contain detailed information on tax identifiers to be matched

[11] In August 2012, the Ministry of Labor introduced the created the possibility of targeted inspections aimed at the compliance of the AA quota (Normative Instruction SIT 98) (de Souza, 2023). I restrict my sample analysis to firms that have been inspected until then because I am unable to identify these targeted inspections from the data.

[12] The final amount of fines is a function of the number of workers with disabilities or rehabilitated workers that firms fail to hire in compliance with the AA quota regulation. It may also depend on numerous factors, such as firm size, recidivism, economic sector, and geographic location. In some cases, firms may be exempted from the hiring quota if they present proof of attempts to comply with AA quota regulation (e.g., frequent job postings targeting people with disabilities, lack of qualified candidates, etc.). In these cases, the firms may be granted an extended grace period and asked to sign a statement confirming their commitment to comply with the AA quota regulation. In addition, several firms, such as firms from civil construction and oil and gas industries, can obtain an exemption from the AA quota via lawsuits alleging it is not possible to guarantee safe work conditions to workers with disabilities.

[13] Informal conversations with inspectors indicate that systematic frauds do not represent a major concern in the Brazilian context because potential financial penalties and reputation damages for fraudulent practices can be much more severe than the penalties for non-compliance.

with the employee-employer records, the dates on which the reports are submitted (used here as the start dates of labor inspections), and the labor violations (e.g., formal registration, hours of work, severance pay, minimum wage, etc.) found during labor inspections.

Firm- and Worker-Level Data. Labor market information is extracted from RAIS (*Relação Anual de Informações Sociais*), a matched employee-employer data from the Ministry of Labor. It provides a comprehensive and high-quality annual overview of the formal sector (Szerman, 2023). Firms report information on their workers, including hiring and separation dates, average annual wages, number of hours contracted, occupation, and demographic characteristics, including gender, age, educational level, race, disability status, and type of disability. Information on whether the worker has a disability and the type of disability started to be reported by firms in 2003.[14]

Census Data. The third dataset consists of the decennial Brazilian Demographic Census from 2000 and 2010 sourced from IBGE (Brazilian Institute of Geography and Statistics). The Census contains information on individuals' demographic and socioeconomic characteristics and labor market outcomes, including self-reported degree and type of disability, employment status, and work and non-work (e.g., welfare benefits) incomes. These two waves of Census data allow me to obtain variables of interest before and after the 2000 reform. Relative to the matched employee-employer data, the Census has the advantage of providing labor market outcomes outside the formal sector. Due to fundamental methodological differences in questions regarding disabilities from the 1991 and 2000 Censuses, I do not use data from 1991, the first edition with questions on disability.[15] I define individuals who report in the Census living with some or severe difficulties as persons with disabilities.

Other Data. I rely on additional minor sources of data to conduct the main analyses. First, information on municipal characteristics, such as gross domestic product (GDP) and

[14]Disability status and type of disability are rarely reported in the matched employee-employer records, limiting progress in research on the role of employers and workplace policies on disability disadvantage in labor markets. This limitation has been described in Baldwin and Johnson (2006): "*there is also a serious shortage of data that support empirical analyses of the labor market experiences of persons with disabilities. (...) The ideal data set includes detailed information on employment, wages, work experience, and job characteristics, as well as information on health conditions, functional limitations, and disability status.*"

[15]Appendix A.4 describes the methodological differences. Because oversight and monitoring of the AA quota through labor inspections became possible only after 2003, I use 2000 as the pre-reform period.

population, is extracted from Ipeadata. Second, I gather labor offices' addresses from official sources and link them to their date of creation extracted from Ponczek and Ulyssea (2021) to maintain labor offices created before the enactment of the regulation. Third, I also use this information to construct a measure of enforcement capacity by computing the minimum distance between each micro-region and the nearest labor office using the Google Maps API.[16] Fourth, to understand how people with disabilities are perceived in the Brazilian labor market and to disentangle several mechanisms behind the results, I designed and implemented an original survey conducted with human resources executives and personnel. The survey includes vignettes in which information on disability is experimentally manipulated, along with questions about affirmative action support, challenges, and concerns in hiring people with disabilities. Appendix G provides a detailed description of the survey.

4 Aggregate Analysis

In this section, I analyze the aggregate effects of the 2000 reform on employment and wages for people with and without disabilities across local labor markets. The next section closely examines how firms respond to the AA quota scheme. The institutional context suggests that labor markets with a high concentration of large plants and frequent labor inspections are more likely to experience an increase in the demand for workers with disabilities after the 2000 reform. To gauge the aggregate effects of the reform on employment and earnings for people with and without disabilities across local labor markets, this section proposes an identification strategy that exploits two dimensions of the reform: the timing of its enactment and the spatial heterogeneity in potential exposure.

4.1 Exposure to the 2000 Reform

I construct a measure of local exposure to the reform in three steps. First, I define local labor markets at the micro-region level. In Brazil, micro-regions consist of an aggregation of economically integrated contiguous municipalities with similar economic and geographic characteristics. These micro-regions delineate local economies, similarly to commuting zones

[16] I obtain the distance between the centroid of each municipality and the nearest labor office created before the 2000s. I then define the minimum distance of the municipalities that belong to each micro-region as the minimum distance between each micro-region and the nearest labor office, which is used as a proxy for enforcement capacity.

in the US. Second, I define potential demand for workers with disabilities across local labor markets as the share of people with disabilities that would potentially benefit from jobs reserved by the AA quota regulation:

$$potential\ demand_r^{pre} = \frac{potential\ jobs_r^{pre}}{total\ PwD_r^{pre}}. \tag{1}$$

The numerator, $potential\ jobs_r^{pre}$, represents the total number of jobs in the private sector available to people with disabilities in each micro-region r in case of perfect compliance with the AA quota. I calculate this number from the distribution of firm size in 1998, before the reform, extracted from RAIS data. The denominator, $total\ PwD_r^{pre}$, normalizes potential jobs by the pre-reform number of people with disabilities in each micro-region r, calculated from the 2000 Census. The term $potential\ demand_r^{pre}$ ultimately captures pre-reform spatial heterogeneity in potential demand for workers with disabilities across local labor markets and has a median ratio of 5 percent. I then classify micro-regions above and below this median as micro-regions with strong and weak potential demand. Figure B1, Appendix B, shows how potential demand varies geographically. The areas with strong potential demand are concentrated in the Southeast and South regions, which are the most developed in the country with larger labor markets.

The third step consists of building off a measure of enforcement capacity developed by Almeida and Carneiro (2012) and used in other papers (Haanwinckel and Soares, 2021; Ponczek and Ulyssea, 2021) to exploit spatial heterogeneity in the enforcement of labor regulation. The Ministry of Labor adopts a straightforward technology of enforcement, requiring only two inputs: inspectors who are assigned to labor offices and travel distance by car between labor offices and inspected firms. In principle, micro-regions located farther away from labor offices are less likely to receive inspections. Figure B4, Appendix B, confirms this negative relationship between the number of inspections per firm and the distance to the nearest labor office. It motivates the use of minimum travel distance to the nearest labor office within each micro-region as a proxy for enforcement capacity. To ensure that the measure of enforcement capacity does not respond to changes in local labor market conditions and adjustments to the AA quota regulation, I limit the analysis to labor offices created before the reform. The median distance is about 60 kilometers (or 66 minutes). I then classify micro-regions with pre-determined distances below and above the median as those with weak and strong enforcement capacity. Figure B2, Appendix B, illustrates the

variation in enforcement level across micro-regions.

To retrieve a cross-sectional variation, I interact both the potential demand and enforcement capacity measures to compute the initial levels of local exposure to the reform. Figure 2 plots the geographic variation of the four classifications of the interaction term. Intuitively, persons with disabilities from areas with strong potential demand and enforcement levels should experience larger labor market responses relative to those located in areas with weak potential demand or/and weak enforcement capacity. Important to the empirical strategy, this cross-sectional variation is pre-determined with respect to the introduction of reform.

4.2 Empirical Strategy

My empirical strategy for the market-level analysis considers both the timing of the reform and the spatial heterogeneity in exposure to it. Put differently, I estimate the following regression model using the Census data:[17]

$$y_{rst} = \alpha + (\mathbf{1}_r^{SD,SE} \times Reform_t)\beta_1 + (\mathbf{1}_r^{SD,WE} \times Reform_t)\beta_2 + (\mathbf{1}_r^{WD,SE} \times Reform_t)\beta_3 + \alpha_r + \alpha_t + \alpha_s \times t + X_{r,2000}\lambda + \varepsilon_{rst}, \tag{2}$$

in which subscripts r, s, and t stand for micro-region, state, and time; the indicator variables $\mathbf{1}_r^{SD,SE}$, $\mathbf{1}_r^{SD,WE}$, and $\mathbf{1}_r^{WD,SE}$ represent micro-regions with strong potential demand and enforcement capacity, with strong potential demand and weak enforcement capacity, and with weak potential demand and strong enforcement capacity, respectively; $Reform_t$ is an indicator for the period after the 2000 reform; α_r and α_t delineate micro-region and time fixed effects; $\alpha_s \times t$ represents state-specific trends; $X_{r,2000}$ is the vector of baseline characteristics of the micro regions in 2000, including the share of female population, shares of population with high school and college degrees, share of urban population, unemployment rate, literacy rate, and GDP per capita, all interacted with time fixed effects; y_{rst} is the labor market outcome of interest. Standard errors are clustered at the micro-region level.

The coefficients of interest—β_1 to β_3—capture differential labor market responses across micro-regions with distinct levels of exposure relative to omitted micro-regions with weak

[17] The aggregate analysis uses the Census data for two main reasons. First, it allows an overview outside the formal sector. Second, information on disabilities from the RAIS data started to be collected in 2003, after the reform. In Section 4.3, I propose a robustness exercise using RAIS data.

potential demand and enforcement capacity before and after the reform. To assuage concerns related to common shocks affecting micro-regions and time-invariant characteristics of micro-regions that might be correlated with both the exposure measure and the outcomes of interest, this specification includes both time and micro-region fixed effects. I also add state-specific trends to control for policies or unobservable shocks specific to states. Although the exposure measure is constructed to be pre-determined with respect to the introduction of the quota regulation, it might be correlated with initial labor market characteristics for people with disabilities across local labor markets. For instance, micro-regions with different initial levels of economic characteristics might undergo different labor market paths, implying that our estimates could capture differential economic trends across micro-regions. The set of baseline controls X_{rt} accounts for heterogeneous initial characteristics that can also influence the labor market outcomes, permitting differential trends across micro-regions with heterogeneous initial characteristics.

This empirical strategy relies on the assumption that, conditional on the set of baseline characteristics, the cross-sectional and local exposure measure is orthogonal to omitted characteristics correlated with differential changes in labor market outcomes for people with disabilities after the reform. While it is not possible to directly test for this assumption, three additional pieces of evidence mitigate potential concerns related to it. First, the cross-sectional variation is constructed to be pre-determined to the reform's passing. Second, although it is not possible to test for pre-trends using the Census data because the 2000 edition is the first and only Census wave with reliable information on disability before the reform, Section 4.3 documents no evidence of pre-trends when using alternative RAIS data. Third, I examine the effects on the informal sector and people without disabilities as placebo tests. One could argue that some omitted characteristics, captured by the exposure measure, remain unaccounted for. In this context, it is hard to think of omitted variables that would simultaneously lead to an increase in formal employment and no impacts on informality for people with disabilities in response to the reform within the same state and after controlling for the set of baseline controls. Evidence that workers without disabilities from both the formal and informal sectors are *not* significantly affected by the reform provides reassurance that these omitted characteristics are unlikely to invalidate my empirical strategy.

Sample and Summary Statistics. Starting with individual-level data from the Census, the sample includes the working-age population aged between 25 and 54 to focus on individuals with strong labor force attachment. For each micro-region, I separately compute employment and informality rates and average incomes for people with and without disabilities. Table C1, Appendix C, displays the summary statistics of the variables used in the aggregate analysis and confirms that people with disabilities have worse labor market prospects than those without disabilities. Most demographic, economic, and labor market variables display a high dispersion, indicating that micro-regions are quite heterogeneous along these dimensions.

4.3 Market-Level Results

I begin by documenting the relationship between local exposure measures and changes in employment. Table 1 compares micro-regions that belong to each of the three groups of exposure to those with weak potential demand and enforcement capacity. Column (1) indicates that the reform leads to a significant increase by 1.1 percentage points (p.p.) in the share of people with disabilities who are employed in the formal sector exclusively in local labor markets with strong potential demand and enforcement capacity. The magnitude corresponds to an increase of 9.5 percent relative to the baseline mean of 0.117 in 2000. In other words, moving a region from the lower (like Rio Negro in the Amazon region) to the upper median (like the cities of São Paulo or Rio de Janeiro) of the distribution of enforcement capacity and potential demand induces an increase of 9.5 percent of formal employment for people with disabilities.

Column (1) confirms that labor market prospects for workers with disabilities located in areas with either weak potential demand or weak enforcement capacity remain unaffected after the reform, reinforcing the strong complementarities between enforcement and regulation. As falsification tests, Columns (2) to (4) assess whether the exposure measure is correlated with changes in formal employment for people without disabilities or in the informal sector. I find small and statistically insignificant coefficients across all specifications. The lack of changes in informality rates for people with disabilities also suggests that the increase in formal employment does not come from reallocation from the informal to the formal sector.

Turning to the effects on earnings, Table 2 shows that only micro-regions with strong potential demand and enforcement capacity display larger impacts on income from work for

people with disabilities. The average work income rises by around 26.12 Brazilian *reais*, equivalent to a 7 percent increase relative to the baseline mean in 2000. It is a mechanical result of higher employment levels for this group. There are no spillovers on non-work income (Column (2)) or people without disabilities (Columns (3) and (4)). These findings together reveal that the benefits of the reform are mostly accrued by people with disabilities from local labor markets with higher exposure to both enforcement capacity and AA quotas regulation.[18]

Additional Results. I present two additional results. First, to overcome the lack of pre-reform years in the Census data, I rely on RAIS records. Because information on disability only started to be collected in 2003, I use data from 2003 to identify individuals ever reported as having disabilities to assign retroactive information on disability to individuals found in RAIS between 1997 and 2002. This approach, albeit imperfect, permits an indirect test for pre-trends using the share of people with disabilities in the formal sector as the outcome variable. Figure B5, Appendix B, corroborates the lack of pre-trends and validates the previous findings that people with disabilities in local labor markets more exposed to the reform experienced larger increases in employment. Second, Columns (1) to (3) of Table C3, Appendix C, confirm that migration and number of hours worked do not drive this increase in employment, rejecting that the reform induced the reallocation of people with disabilities across space and through the intensive margin of employment.

5 Firm-Level Analysis

The aggregate analysis shows that the reform increased formal employment and earnings for people with disabilities in more exposed local labor markets without generating spillover effects to workers without disabilities or to workers in the informal sector. An interesting question is whether and how firms adjust to mandated employment. Investigating the reallocation of firm activities in the cross-section of firms is key to quantifying the policy incidence.

[18] Table C2, Appendix C, considers work income from the formal sector and work income from the informal sector as outcome variables separately. These definitions are different from overall work income in Table 2. Conditional on employment, I do not find differences in work income in both the formal and informal sectors, corroborating that the baseline gains in earnings are driven by higher employment in the formal sector rather than higher earnings among the employed. Manning (2011) argues that increasing mandated employment does not necessarily translate into an increase in wages. Firms can increase recruitment activity or reduce worker quality. Section 5 presents evidence of both channels.

To address this question, I combine the requirement for firms with at least 100 employees to have workers with disabilities and the variation in the exposure to the AA quota generated by labor inspections. The section provides compelling graphical evidence of the short- and medium-term impacts and examines a broad range of outcomes and mechanisms.

5.1 The Employment Effects

5.1.1 Empirical Strategy

In the first part of the firm-level analysis, I estimate the employment effects of disability hiring quotas. Figure D1, Appendix D, confirms that the AA quota is rarely enforced without labor inspections. Because only firms with at least 100 employees may be required to hire workers with disabilities, my empirical strategy exploits both the AA quota requirement and the precise timing of the labor inspections by comparing inspected firms with pre-inspection employment levels above and below the cutoff of 100 workers, which represent treatment and control firms, before and after inspection. I estimate the following event-study model:[19]

$$y_{jt} = \sum_{k=-6}^{k=12} [\beta_k^{Quota} \times \mathbf{1}(t_j = t^* + k) \times Quota_{j,pre} + \theta_k \times \mathbf{1}(t_j = t^* + k)] + \alpha_j + \alpha_t + X_{jt}\gamma + \varepsilon_{jt}, \tag{4}$$

in which subscripts j and t stand for firm and quarter-year; $\mathbf{1}(t_j = t^* + k)$ are dummies indicating an event in quarter-year k relative to the quarter-year t^* in which the firm is inspected, proxied by the quarter-year before its final inspection report is submitted; $Quota_{j,pre} = \mathbf{1}(\text{Emp}_j \geq 100)$ is an indicator variable for firms with at least 100 employees prior to inspection, which represent the treated group; α_j are firm fixed effects; α_t are quarter-year fixed effects; X_{jt} are time-varying firm-level controls and include state- and industry-specific trends; and y_{jt} is the employment outcome of interest. Year fixed effects control for common shocks affecting the firms each quarter-year. Firm fixed effects control

[19] In addition to the event-study analyses, I perform standard difference-in-differences analyses in which I pool pre- and post-inspection periods and estimate the following model:

$$y_{jt} = \alpha_j + \alpha_t + \tilde{\beta} \times Post_t \times Quota_{j,pre} + X_{jt}\gamma + \varepsilon_{jt}, \tag{3}$$

in which subscripts and the set of controls and fixed effects are the same as in Equation (4), and $Post_t \times Quota_{j,pre}$ is an indicator variable equal to 1 for all quarters after inspection in firms under the AA quota. Standard errors are clustered at the firm level.

for time-invariant characteristics of firms that might be correlated with the outcomes of interest and the AA quota requirement. Standard errors are clustered at the firm level.[20]

The post-event coefficients of interest—β_k^{Quota}—capture the dynamics effects of the AA quota requirement relative to two quarters before the labor inspection. To mitigate concerns related to selection into labor inspections, the sample contains *all* firms who have been inspected. Once inspected, the firms may be assessed for compliance with several dimensions of the labor code, including formal registration, minimum wage, and mandated benefits. The key difference is that *only* firms with at least 100 employees by may also be assessed for compliance with the AA quota targeting people with disabilities, allowing me to exploit the differential impacts based on the regulation threshold. To my knowledge, there is no other firm regulation using the threshold of 100 employees in the country.

Identification in Equation (4) relies on the timing of labor inspection being uncorrelated with the outcomes of interest, *conditional* on firm and time fixed effects and firm-level controls, X_{jt}. The key identifying assumption is that outcomes for treated and control firms would have followed parallel trends in $k > 0$ if no inspection had occurred for treated firms. I test this assumption by assessing whether the pre-event coefficients of interest are statistically indistinguishable from zero.

The estimates are likely to be biased if firms in different size categories had different trends in the absence of labor inspections. For instance, economic shocks might have affected large and small firms differently. I implement several additional steps to assuage these concerns. First, the baseline specification includes a local sample of firms with pre-inspection employment levels between 75 and 125 employees. Second, I probe the robustness of my main results by considering narrower bandwidths around the cutoff of 100 employees and dropping firms very close to it. Third, time-varying controls X_{jt} include state- and industry-specific trends to control for policies or unobservable shocks specific to states and industries.

[20] One natural candidate for identification in this context is the use of a local regression discontinuity design. This strategy is not compelling because the running variable is rarely well-defined in the administrative data for employment measures and there is some potential firm selection around the threshold of interest. Including firm and time fixed effects, along with industry and location trends, mitigates concerns related to firm selection and allows me to focus exclusively on the variation occurring across quarters and within firms. Another potential candidate is the bunching estimator. As shown in Figure D2, Appendix D, there is no visual evidence that firms bunch below the 100 employees threshold, suggesting that firms do not avoid being subject to the AA quota regulation. These findings motivate dynamic difference-in-differences design as the main empirical strategy.

Sample and Summary Statistics. I take several steps to construct the sample of interest. First, I obtain a list of firms that have been inspected together with the earliest date of inspection reports to avoid duplicated observations. This ensures that the timing of inspections is unexpected to the firm. I also do not impose any restrictions related to violations uncovered by inspections. After generating quarterly labor market information from the RAIS data by combining information on hiring and separation dates, the second step consists of matching inspected firms to the quarterly data. Third, I limit the sample to firms found in the RAIS data from six quarters before to fourteen quarters after the first inspection, allowing me to estimate the dynamic impacts spanning five years. Fourth, I categorize firms with less or more than 100 employees as control and treatment groups from the total number of employees before the inspection, following the criteria used by inspectors.

Table F2, Appendix F, presents summary statistics. Before inspections, both the control and treatment firms are comparable along observable dimensions, such as the distribution of workers with disabilities, average earnings, location, and economic sector. The exception is that, as expected, control firms have, on average, fewer employees (74.87 employees) relative to the treated firms (96.40). After inspections, employment for people with disabilities increases more in treated firms. The average number of employees with disabilities increases from 0.29 to 0.77. In addition, 26 percent of treated firms report having at least one worker with disabilities after inspections, compared to 13 percent from the pre-inspection period. Control firms experience more modest increases, corroborating that compliance with the AA quota is not required for them. Table F1, Appendix F, shows that control and treatment firms are comparable in violations uncovered during labor inspections, suggesting that inspected firms are not systematically targeted for non-compliance with the AA quota.[21]

5.1.2 Firm-Level Results

Effects on Employment of People with Disabilities. To capture the effects of enforcing the AA quota on the employment of people with disabilities, I consider three complementary outcomes: the extensive and intensive margins of employment responses, measured by an indicator variable for having at least one worker with disabilities and the number of workers with disabilities, and the share of workers with disabilities, defined as total workers

[21] Table F1, Appendix F, demonstrates that firms from my sample analysis are more likely to have violations related to severance pay and less likely to have violations related to working hours, rest, and formal registration relative to the universe of all inspected firms.

with disabilities divided by the total number of workers in each firm (multiplied by 100). I find strong and persistent increases in employment. Figures 3(a)–3(c) display $\hat{\beta}_k^{Quota}$, along with 95 percent confidence intervals, for selected variables. The pre-event coefficients are statistically equal to zero, supporting the assumption that both treatment and control firms have similar pre-inspection trends. Following inspections, there is a sharp increase in the number of workers with disabilities, a pattern that becomes strong and persistent over time.

Figure 3(a) and Column (1) of Table 3 indicate around a two-fold increase in the number of workers with disabilities after inspections. Considering the extensive margin of employment, Figure 3(b) and Column (2) of Table 3 report that treated firms, in the long run, are 7.9 p.p. more likely to have at least one employee with disabilities after inspections. Figure 3(c) and Column (3) of Table 3 further corroborate the increase in the share of workers with disabilities. I also take advantage of the panel structure of the data to investigate the extent to which my results are driven by relabeling of existing workers with disabilities (Lalive et al., 2013). Column (2) of Table F3, Appendix F, shows that half of the 100 percent increase in the number of workers with disabilities occurs through relabeling, and the remainder 50 percent through new hires. Reassuringly, Figure E3, Appendix E, presents the findings for new hires and separations, confirming that adjustments in employment of people with disabilities mostly come from higher arrival rates rather than lower departure rates.

Effects on Other Outcomes. I investigate other margins of responses to understand whether firms finance new hires with disabilities through lower average wages or profits. Because I do not have data on firm profits, I use an indicator of exiting the formal sector as an imperfect proxy for profits. Exit is defined as equal to one if the firm does not have any formal employees in a given quarter-year. Figures 3(d)–3(e) and Columns (4)–(5) of Table 3 indicate no significant impacts on wages for workers without disabilities or firm exit.[22] Figure D.2, Appendix D, indicates no evidence for avoidance in the form of bunching below the threshold that would arise in case of costly compliance with the regulation.

I next examine the impact on workers without disabilities. Column (6) of Table 3 shows no significant declines in the employment of people without disabilities. Although the pre-

[22]Evidence on the impacts of the AA quota on profits is mixed. Consistent with my results, Mori and Sakamoto (2018) find that firm profits are not affected in Japan despite the increase in employment of people with disabilities. Peck (2017) documents opposite findings in Saudi Arabia's *Nitaqat* program, which determined aggressive quotas for firms to hire Saudis at private firms.

trends from Figure 3(f) urge caution in lending a causal interpretation to this result, I note that Section 4 points to no evidence that people without disabilities in local labor markets more exposed to the 2000 reform are affected. Combined with the lack of significant declines in new hires and separations (Figure E3, Appendix E), our findings together provide reassurance that firms do not seem to respond to the enforcement of the AA quota through labor substitution.

Heterogeneity. The level of detail of the RAIS data allows me to scrutinize the extent to which firms respond to the AA quota considering different types of jobs. Figure E4, Appendix E, shows that the increase in employment for people with disabilities is concentrated among low-skill, low-paying occupations.[23] Concerning heterogeneity across educational levels, firms recruit more from those without a college degree.

Another important source of heterogeneity relates to the distinction between different types of disabilities, a unique feature from the Brazilian data. Starting in 2006, employers report whether the worker has one of the following disabilities: physical, hearing, visual, intellectual, or multiple (two or more disabilities). Individuals who received vocational rehabilitation services may also be classified as having disabilities for quota purposes. Figure E4, Appendix E, indicates that employment increases for those with physical disabilities, followed by hearing and other disabilities, suggesting preferences for milder forms of disabilities.[24]

Robustness Checks. Table F3, Appendix F, reports additional checks to ensure that my findings are robust to alternative variables, specifications, and sample definitions. Column

[23] I have information on occupations, allowing me to categorize each worker into one of the following categories: (i) managers (e.g., manager and director); (ii) high-skill professionals (e.g. researchers, teachers, doctors, nurse, engineers, technicians, architects, mathematicians, and statisticians); (iii) low-skill white collar jobs (e.g., cashier, receptionist, secretary, and library assistant); and (iv) blue-collar jobs. Consistent with my results, in the US context, Holzer and Neumark (1999) show that firms under affirmative action are more likely to hire minorities with lower levels of education and for jobs with lower skill requirements.

[24] Because visual, intellectual, and multiple disabilities represent a small fraction of disabilities, I pool them together. RAIS data does not contain further details on disabilities. Instead, I use an alternative source of data from the public sector with personnel records from the federal government to get a sense of the distribution of disabilities among employed individuals: partial visual impairment (16.72 percent); congenital or acquired deformity (13.11 percent); reduced mobility, permanent or temporary (10.17 percent); partial hearing impairment (8.46 percent); bilateral hearing impairment (5.98 percent); monoparesis (5.33 percent); amputation (5 percent); deafness (4.73 percent); paraplegia (3.66 percent); monoplegia (3.12 percent); blindness (2.82 percent); hemiparesis (1.83 percent); paraparesis (1.70 percent); multiple disabilities (1.20 percent); tetraparesis (0.99 percent); cerebral palsy (0.98 percent); hemiplegia (0.92 percent); intellectual disability (0.71 percent); tetraplegia (0.47 percent); dwarfism (0.35 percent), and others.

(1) repeats the benchmark specification from Table 3. Columns (3) and (4) confirm that conclusions regarding the employment of people with disabilities do not change when taking its inverse hyperbolic sine transformation and considering a conditional fixed-effect Poisson model to account for the count nature of the data. The Poisson method corroborates the lack of negative significant impacts for workers without disabilities (Column (5)). Column (6) excludes state- and industry-specific trends and shows similar results. As discussed in Section 5.1.1, Columns (7) and (8) consider more local specifications with closer bandwidths around the threshold of 100 employees, whereas Columns (9) and (10) exclude firms close to it. I find similar estimates across sample restrictions.

5.2 The Wage Effects

5.2.1 Empirical Strategy

While the conclusion that AA quotas led to higher employment for the targeted group is consistent with the literature, there is a dearth of evidence of the impacts of quotas on workers' outcomes, including wages. To further understand the effects on workers' outcomes, I estimate the following specification:[25]

$$w_{ijt} = \sum_{k=-6}^{k=16} [\beta_k^{Quota} \times \mathbf{1}(t_j = t^* + k) \times Quota_{j,-1} + \theta_k \times \mathbf{1}(t_j = t^* + k)] + \alpha_j + \alpha_t + X_{jt}\gamma + X_{ijt}\delta + \varepsilon_{ijt}, \tag{6}$$

in which subscripts i, j and t stand for worker, firm and quarter-year; $\mathbf{1}(t_j = t^* + k)$ are dummies indicating an event in quarter-year k relative to the quarter-year t^* in which the firm is inspected; $Quota_{j,-1} = \mathbf{1}(\text{Emp}_j \geq 100)$ similar to Equation (4) and represents an indicator variable for firms under the AA quota for having at least 100 employees in the quarter-year prior to inspection; α_j are firm fixed effects; α_t are quarter-year fixed effects; and the vectors X_{jt} and X_{ijt} represent firm- and worker-level controls. Firm-level controls consist of state-

[25] In addition to the event-study analysis, I conduct a difference-in-differences analysis in which I pool pre- and post-inspection quarters and estimate the change in wages considering the following model:

$$\log w_{ijt} = \alpha_j + \alpha_t + \tilde{\beta} \times Post_t \times Quota_{j,-1} + \alpha_j + \alpha_t + X_{jt}\gamma + X_{ijt}\delta + \varepsilon_{ijt}, \tag{5}$$

in which subscripts and the set of controls and fixed effects are the same as in Equation (6), and $Post_t \times Quota_{j,-1}$ is an indicator variable equal to 1 for all quarters after inspection in firms under AA quota. As before, standard errors are clustered at the firm level.

and industry-specific trends. Worker controls include individual characteristics available in the RAIS data, such as gender, race, educational level fixed effects, age, and square age, along with occupation group fixed effects. Standard errors are clustered at the firm level.

Similar to Equation (4), the post-event coefficients—β_k^{Quota}—capture the dynamic impacts of the AA quota relative to the quarter-year before the labor inspection. Identification assumptions of Equation (6) rely on the timing of labor inspection being uncorrelated with the outcomes of interest, *conditional* on the set of controls. The key identifying assumption is that the wage outcomes for workers in firms with and without AA quota requirement, representing treatment and control firms, would have followed parallel trends in $k > 0$ if no inspection had occurred for firms under the AA quota. I test this assumption by assessing whether the pre-event coefficients of interest are statistically indistinguishable from zero.

Sample and Summary Statistics. To examine the wage effects, I use the natural logarithm of hourly wages as the main outcome.[26] To obtain the sample of workers, I recover all individuals at the same set of firms from the firm-level analysis. I construct the worker-level sample at the quarterly frequency and spanning the period from six quarters before to sixteen quarters after the inspection. This choice offers two advantages.[27] First, this sample is comparable with the firm-level sample, enabling a closer examination of the dynamic effects. Second, the longer panel enlarges the sample size, increasing statistical power. Statistical power is a relevant limitation in this context since people with disabilities are underemployed.

Table F4, Appendix F presents summary statistics during the quarters before and after inspections for workers from both treated and control firms. Both groups of workers are similar along observable characteristics, including wages, disability, gender, race, education, occupation, location, and economic sector. Considering the pre-inspection period, nearly 0.4 (0.3) percent of control (treated) workers have a disability, earn about 12.68 Brazilian *reais* (12.42 Brazilian *reais*) as hourly earnings, 66 (65) percent are male, 66 (68) percent are white, 10 (10) percent have a college degree, and 66 (66) percent have blue-collar jobs.

[26] This outcome combines information on contracted hours and average wages. The latter contains other forms of compensation, including overtime premiums, bonuses, commissions, and other benefits.

[27] Until 2015, information on wages from the RAIS data is reported at the annual frequency. I transform them into quarterly data by combining information on earnings with hiring and separation dates.

5.2.2 Worker-Level Results

To gauge the impact of enforcing the AA quota on workers' wages, I estimate Equation (6), which compares workers from firms under the AA quota to those unaffected by the regulation, before and after inspection. Figure 4(a) illustrates the dynamics of wages around inspection shocks for workers with and without disabilities. The pre-event coefficients are statistically equal to zero, validating my empirical strategy. As expected, the confidence intervals for persons with disabilities are much larger due to the smaller sample size.

Table 4 displays the immediate ($k = 0$), short run ($k = 6$), long run ($k = 12$) impacts, together with the aggregate impacts. In the first quarters following inspections, the estimates for both groups of workers are statistically insignificant. Over time, the quarterly wage growth does not change for workers without disabilities, indicating that the policy has limited consequences for non-targeted groups. On the other hand, wage growth becomes slower for people with disabilities at firms under the AA quota. The estimates imply that these workers experience 5.7 percent slower wage growth relative to the baseline wage growth rates (Column (4) of Table 4). I note that the inclusion of firm and quarter fixed effects requires firms from treatment and control groups to have at least one worker with disabilities before inspections to estimate the coefficient of interest for people with disabilities.

Columns (5) and (6) of Table 4 and Figure E5, Appendix E, also investigate whether there are differential impacts for incumbent workers and new hires. I find evidence for both groups of workers. Incumbent workers with disabilities experience reduced wage growth. At the same time, due to large standard errors, I cannot rule out negative impacts for new hires.[28] The results point to an unintended consequence of mandated employment: Despite the reduction in inequality at the *hiring* level through higher employment opportunities, firms can adjust to mandated employment through lower wage growth, exacerbating *within*-firm inequality *between* groups.

One concern with my estimates is that, on average, workers with disabilities are less educated, less experienced, and more likely to be employed in low-skill occupations, imply-

[28] To assess the impact on incumbent workers, I estimate the following model:

$$w_{ijt} = \sum_{k=-6}^{k=16} [\beta_k^{Quota} \times \mathbf{1}(t_j = t^* + k) \times Quota_{j,-1} + \theta_k \times \mathbf{1}(t_j = t^* + k)] + \alpha_i + \alpha_j + \alpha_t + \varepsilon_{ijt}, \quad (7)$$

in which the subscripts and remaining variables are similar to Equation (6); and α_i are worker fixed effects.

ing that the wage results could reflect differences along these dimensions and, as a result, in productivity. Including worker controls does not affect the results (Column (2) of Table 4). As a sanity check, I also report estimates using two re-weighting methods to reduce observational dissimilarities and allow workers with and without disabilities to be similar along several pre-inspection characteristics: gender, race, age, squared age, education, and occupation. Figure E6, Appendix E, presents estimates using inverse propensity score and entropy-balancing weights from (Hainmueller, 2012) to ensure balance across these characteristics. My results are robust to re-weighting methods, alleviating concerns related to dissimilarities in observable characteristics across disability status.

Effects on Additional Worker Outcomes. Figure 4 and Table 5 display results for other labor market outcomes. I document the impacts on the intensive margin of employment measured by the number of hours specified in the employment contract and the likelihood of part-time employment. Figures 4(b) and 4(c) corroborate the lack of evidence supporting such responses for workers with and without disabilities. I also analyze the effects on turnover. Figure 4(d) shows that the probability of staying at the firm is higher for workers with disabilities in firms under AA quota in the first quarters following inspection and then gradually dwindles. I do not find a similar pattern for workers without disabilities.

5.2.3 Heterogeneity and Mechanisms

Using observational data and qualitative evidence from a survey conducted with firms (see Appendix H for further details) together with an analysis of heterogeneous responses, this section investigates potential explanations for the wage effects among workers with disabilities, with the limitation that the findings only allow a suggestive glimpse into mechanisms due to the lack of on-the-job data and clean experiments. Which mechanism ultimately explains my findings is hampered by data constraints and left for future work.

Discrimination. A large body of literature has documented employer discrimination against people with disabilities using observational evidence or experiments (Baldwin and Johnson, 1994, 2006; Baert, 2016; Ameri et al., 2018). Discrimination can be taste-based or statistical. Becker (1957)'s theory of taste-based discrimination posits that employers have a negative animus towards people with disabilities regardless of productivity considerations.

Two pieces of evidence seem inconsistent with this theory. First, an affirmative action policy would make firms hire more qualified workers with disabilities. Instead, I find an increase in the employment of workers without a college degree. Second, to match the empirical patterns, the taste-based theory implies that employers have developed some distaste for workers with disabilities over time. This seems unlikely in light of evidence that tastes are not easily malleable in the short term (Beaman et al., 2009).

Models of statistical discrimination assume that employers cannot directly observe workers' skills (Phelps, 1972; Arrow, 1973; Aigner and Cain, 1977). Instead, they observe signals to infer workers' skills and are less able to interpret the signals of workers from a minority group. In a dynamic setting with promotion, Bjerk (2008) shows that, if two groups differ in average skill level or frequency they can signal their skills at lower level jobs, similarly skilled workers from two groups can display different career progression because members from the minority group need to accumulate more positive signals to get better task assignments. Lehmann (2011) shows that this pattern can result from an affirmative action policy, in which firms recruit more workers from the minority group, but require more positive signals for better task assignments.[29]

In my setting, AA quotas induce firms to lower hiring standards to recruit more workers with disabilities, making signals of this group more difficult to interpret (Coate and Loury, 1993; Moro and Norman, 2003; Fang and Moro, 2011). Both observational and survey evidence suggest that the average skill level of the group of people with disabilities declines as additional less-educated workers are hired. Figure E4, Appendix E, reveals that firms under the AA quota hire more disabled workers without a college degree.[30]

A key prediction of these models is that firms under the AA quota require more positive signals from workers with disabilities for better task assignments, retarding their career progression (Bjerk, 2008; Lehmann, 2011). I propose an indirect test without on-the-job data. To assess whether workers who are less able to send signals of their skills are more likely to experience wage growth slowdowns in firms under the AA quota, I use two dimensions along which workers can send signals of their skills: educational degree and interpersonal

[29] Bjerk (2008)'s "sticky-floor" model was originally used to explain the underrepresentation of women and minorities in top jobs in the absence of discrimination concerning promotion. Lehmann (2011)'s model explains the increase in the hiring of black workers in law firms and their underrepresentation as partners.

[30] Survey responses in Appendix G also indicate that firms under the AA quota are more likely to report not finding qualified workers with disabilities or differences in productivity and management time between workers with and without disabilities as challenges.

relationships through the frequency of contact with others in the job.[31] Table 6 reveals that the wage growth slowdowns are concentrated among workers with disabilities with weaker signals of their skills, particularly those without a high school diploma and fewer interpersonal relationships. Those who can send stronger signals of their skills remain unaffected. Regardless of the final mechanism, the fact that group differences are sustained points to the existence of multiple equilibria under affirmative action (Coate and Loury, 1993).

Alternative Mechanisms. I investigate other possible mechanisms that could explain my results. The goal of this exercise is not to disprove that these other channels play a role in the results. Instead, I provide suggestive evidence that they are unlikely in my setting.

One candidate is that firms may incur fixed costs due to the AA quota. For instance, employers may experience increases in workplace accommodation costs (e.g., assistive technologies) or capital investments (e.g., specialized employment agencies) to improve the screening of candidates with disabilities (Oi, 1991; Acemoglu and Angrist, 2001; Miller, 2017). As a result, employers may offset the extra irreversible fixed costs to workers with disabilities. Several pieces of evidence are inconsistent with this explanation. Incumbent workers with disabilities were hired before the inflow of new hires, suggesting that, if these costs exist, they were incurred before the new hires. The survey indicates that accommodation costs and screening technologies play a very minor role.[32] The lack of evidence supporting that firms provide accommodations or other amenities also implies that the theory of compensating differentials, in which firms may provide lower wage premiums to compensate for positive amenity shocks, is an unlikely explanation (Rosen, 1986).

In line with the fixed costs theory, rent-sharing models suggest that the AA quota might affect firm rents, impacting the wages of workers (Stole and Zwiebel, 1996; Jäger and Heining,

[31]The former is extracted from RAIS data, whereas the latter is obtained from matching occupations from RAIS data to a version of the O*NET database, which ranks occupations according to on-the-job interpersonal relationships. I classify jobs below and above the median of contact, defined as "requiring the worker to be in contact with others" as those such that workers can signal their abilities more frequently.

[32]Only 8 percent of firms in the survey provided workplace accommodations to the last hire with disabilities. None of the respondents reported that it costs more than hiring someone without disabilities for the same position. As a benchmark, in a survey about workplace accommodations conducted by the Job Accommodation Network (JAN) and sponsored by the Department of Labor in the US since 2004, 56 percent of firms reported that the accommodations needed by employees did not cost anything; 39 percent had a one-time cost; and only 5 percent said the accommodation resulted in annual costs. The median expenditure on accommodations with a one-time cost was $500. When asked about the costs incurred to accommodate an employee with disabilities in addition to what they would have paid for an employee without disabilities in the same position, the median answer given by employers is $20 (Job Accommodation Network, 2020).

2022). However, ancillary evidence that firm exit and wages of workers without disabilities remain unaffected, along with robustness from re-weighting methods, suggests that reduced rents are unlikely drivers of the results.

Retaliation against employees due to whistleblowing could also explain the findings. For example, firms might believe that employees are engaged in complaints against them. First, 42, 20.19, 17.54, and 12.99 percent of the firm-level sample have non-mutually exclusive violations related to formal registration, severance pay, working hours, and days off. These numbers suggest that it is unlikely that firms infer that workers with disabilities are whistleblowers. Second, the survey found that 41.67 percent of respondents thought that inspections were likely triggered by employees. When asked who they think made these complaints, workers with disabilities are never mentioned.

6 Implications for Welfare

Thus far, the empirical results point to the consequences of enforcing AA quotas. To explore the potential normative implications of my findings for aggregate welfare, I introduce a simple model of the enforcement of AA quotas with imperfect compliance. Following insights from the literature on law enforcement and disability insurance (Diamond and Sheshinski, 1995; Burlando and Motta, 2016; Haller et al., 2024), the model allows me to characterize the welfare impacts of increasing enforcement of AA quotas for firms, workers, and government. I then provide more context by discussing the implications for each group, and the conditions under which the policy can be welfare-enhancing.

6.1 Welfare Framework

Model Setup. Consider a simple one-period model with populations of firms and people with disabilities of mass unity. In addition, consider the decision to comply with the AA quota regulation for a representative firm. The firm derives disutility from hiring a worker with disabilities, denoted by $\sigma \sim F(\cdot)$, with pdf $f(\cdot)$, which can also capture taste for non-compliance. If σ is small, the firm fully complies with the AA quota and obtains profit or surplus specific to employees with disabilities $MRPL_d - w - \sigma$, in which $MRPL_d$ is the marginal revenue product generated by the employee with disabilities and w is the wage

paid to this employee.[33] If σ is sufficiently large, the firm initially does not comply with the regulation and incurs the risk of detection by the government. With probability $p(\sigma)$, in which $p'(\sigma) > 0$, the government detects non-compliance. In this case, the firm faces the choice between complying with the regulation and hiring an employee with disabilities, $M\tilde{R}PL_d - w - \sigma$, or being sanctioned for delinquency and getting fined by an amount of F.[34] With probability $1 - p(\sigma)$, there is no detection and firm profit does not change.

The firm's choices can be translated into individual payoffs for people with disabilities. When a person with disabilities is employed, she enjoys utility $u(w-\tau)$, in which w represents the wage she earns, τ is the lump-sum tax she pays to the government while employed, and the utility function u is increasing and concave. In the case of unemployment, she claims welfare benefits b from the government and gets utility $v(b)$, in which the utility function v is also increasing and concave. Figures H1 and H2, Appendix H, illustrate the choices.

Let $\sigma^C = MRPL_d - w + p(\sigma^c)F$ denote the threshold value of σ indicating indifference between compliance and delinquency. Firms with $\sigma \leq \sigma^C$ initially comply with the AA quota regulation while those with $\sigma > \sigma^C$ are delinquent. Let $\sigma^F = M\tilde{R}PL_d + F - w$ denote the threshold value indicating indifference between compliance and fine payment conditional on detection. Firms with $\sigma \leq \sigma^F$ prefer to hire a worker with disabilities after detection while those with $\sigma > \sigma^F$ pay the fine. Lastly, assume that $\sigma^F > \sigma^C$ holds.

The government does not observe σ. Instead, it observes an imperfect enforcement level, σ^*, and attempts to increase employment of people with disabilities by increasing enforcement through labor inspections, affecting the probability of detection, $p(\sigma^*)$.[35] I next define the surplus levels for firms and people with disabilities and outline the government budget.

Firms. Given w, the producer surplus associated with hiring people with disabilities is:

[33] For simplicity, I take wages as given. This is consistent with institutional constraints, such as minimum wages, wage floors, and on-the-job wage rigidity, in low-skill jobs and with the fact that workers with disabilities are predominantly concentrated in these jobs.

[34] A small change in notation in the marginal revenue product of labor incorporates potential additional disutility from compliance after detection, such as follow-up checks from the government, bureaucratic hassle, etc., or, more broadly, potential costs firms incur to accommodate a worker with disabilities.

[35] Fines are an alternative policy lever available to a government as part of an enforcement scheme. I assume that the government takes the fine F as given. This assumption is consistent with little variation in the value of fines over time. The lack of credible variation also prevents a direct comparison between labor inspections and fines in this context.

$$\Pi(\sigma^*) = \int_0^{\sigma^c} [MRPL_d - w - \sigma]\, f(\sigma)\, d(\sigma) + \int_{\sigma^c}^{\sigma^F} p(\sigma^*)[M\tilde{R}PL_d - w - \sigma]\, f(\sigma)\, d(\sigma) - \int_{\sigma^F}^{1} p(\sigma^*)[F]\, f(\sigma)\, d(\sigma), \tag{8}$$

in which the right-hand side sums up the surpluses under different scenarios: when there is compliance with the AA quota from the beginning (first term); when the firm complies with the AA quota regulation after detection (second term); when the firm decides to pay a fine after detection (third term). When both non-compliance and non-detection occur, the surplus from hiring people with disabilities is zero.

People with Disabilities. Given w, τ and b, the total welfare of people with disabilities can be expressed as:

$$V(\sigma^*) = \int_0^{\sigma^c} u(w-\tau)\, f(\sigma)\, d(\sigma) + \int_{\sigma^c}^{\sigma^F} p(\sigma^*) u(w-\tau)\, f(\sigma)\, d(\sigma) + \int_{\sigma^F}^{1} p(\sigma^*) v(b)\, f(\sigma)\, d(\sigma) + \int_{\sigma^c}^{1} (1 - p(\sigma^*)) v(b)\, f(\sigma)\, d(\sigma), \tag{9}$$

in which the right-hand side sums up the utilities of different profiles of people with disabilities integrated over the distribution of σ: employed due to initial compliance (first term); employed due to compliance after detection (second term); recipients of welfare benefits in case of fine payment after detection (third term); and recipients of welfare benefits due to both non-compliance and non-detection (fourth term).

Government. The total revenues raised by the government can be written as:

$$R(\sigma^*) = \tau \int_0^{\sigma^c} f(\sigma)\, d(\sigma) + \tau \int_{\sigma^c}^{\sigma^F} p(\sigma^*)\, f(\sigma)\, d(\sigma) + F \int_{\sigma^F}^{1} p(\sigma^*)\, f(\sigma)\, d(\sigma) - b \int_{\sigma^F}^{1} p(\sigma^*)\, f(\sigma)\, d(\sigma) - b \int_{\sigma^c}^{1} (1 - p(\sigma^*))\, f(\sigma)\, d(\sigma), \tag{10}$$

in which the right-hand side accounts for the tax revenues from the employment of peo-

ple with disabilities, the fines raised after detection, and the welfare benefits paid to the unemployed. The government also incurs the cost of enforcement, defined as $C(\sigma^*)$.

Welfare Effects of Enforcing AA Quotas. I assume that the government also uses a higher enforcement level to raise additional fiscal revenues $R(\sigma^*)$, for instance, to increase the provision of public goods that benefit both people with and without disabilities. The government sets enforcement level σ^* to maximize the following social welfare function:

$$W(\sigma^*) = \Pi(\sigma^*) + V(\sigma^*) + R(\sigma^*) - C(\sigma^*). \tag{11}$$

Under standard regularity conditions, Appendix E shows that the welfare effect from raising enforcement level σ^* can be written as:

$$W'(\sigma^*) = \underbrace{M_C[M\tilde{R}PL_d - w]}_{\substack{\text{marginal}\\ \text{firm cost}}} + \underbrace{M_C[u(w-\tau) - v(b)]}_{\substack{\text{marginal welfare}\\ \text{benefit for PwD}}} + \underbrace{M_C[\tau + b]}_{\substack{\text{marginal revenue}\\ \text{benefit}}} - \underbrace{C'}_{\substack{\text{marginal cost}\\ \text{of enforcement}}}, \tag{12}$$

in which $M_C \equiv \int_{\sigma^c}^{\sigma^F} \frac{\partial p(\sigma^*)}{\partial \sigma^*} f(\sigma)\, d(\sigma)$ captures the mechanical increase in employment for people with disabilities due to increased enforcement. Equation (12) illustrates four key objects that govern the effects of increasing enforcement on social welfare. First, the change in producer surplus, which depends on the wedge between marginal revenue products of people with disabilities, $M\tilde{R}PL_d$, and their wages, w. Second, the change in surplus for people with disabilities from working, $u(w-\tau)$, relative to their reservation utility from receiving welfare benefits from the government, $v(b)$. Third, when the government has revenue-maximizing reasons, the extra revenues come from income tax τ and welfare benefits savings b due to higher employment. Fourth, the marginal cost of enforcement (e.g., administrative costs). I note that, since the empirical results show that people without disabilities are unaffected, there is no welfare change for them. By contrast, raising fiscal revenues with increased employment to provide public goods can increase welfare.[36]

[36]Fines represent a lump-sum transfer from firms to the government. Wage adjustments to incumbent workers, under a linear utility function, also represent a transfer from people with disabilities to firms. In theory, the marginal producer cost can account for potential fixed costs to accommodate workers with disabilities. As discussed in Section 5.2.2, both the administrative and survey data point to little evidence of

This framework abstracts from other factors that can contribute to the aggregate welfare. For instance, I do not account for crowd out from public to private health care (Paim et al., 2011) or better health conditions (Sullivan and Von Wachter, 2009) and lower criminal involvement (Deshpande and Mueller-Smith, 2022) due to increased employment as social benefits. I also do not consider welfare losses to workers without disabilities, distortions in the production function, or moral hazard as potential social costs. Because the reduced-form analysis shows little evidence that enforcement of AA quotas affected workers without disabilities or firm outcomes, the social benefits are likely underestimated. Another limitation is that the social welfare function assumes that people with disabilities have the same social welfare weights as firms. The fact that quota policies are prevalent across the world suggests that governments put more value on the welfare of people with disabilities. Estimating these weights is beyond the scope of this paper and an important area for future work.

6.2 Implications and Discussion

Firms. The firm-level analysis in Section 5.1.2 points to no evidence that firms under AA quotas are more likely to exit the formal sector, decrease wages for workers without disabilities, or bunch below the regulation threshold. These pieces of evidence suggest that firms do not experience lower profits. To further support the lack of changes in profits without additional data on firm outcomes, I propose a simple discrete choice framework that provides a tractable closed-form solution to estimate the marginal revenue product of new hires with disabilities with the available data. Another reason for this exercise is the lack of estimates of the marginal revenue product of workers with disabilities.

Conditional on inspection and detection, non-compliant firms have two choices available: They can choose either to pay fines or abide by the AA quota regulation by hiring additional employees up to the requirement. If it chooses to pay fines, firm i gets utility $U_{i,f} = -F_i$, in which F is the amount of fines. If the firm chooses to hire new workers to comply with the regulation after an inspection, it obtains utility $U_{i,c} = \gamma(MRPL_d - w_i) - \epsilon_i$, in which γ is the number of new hires necessary to become compliant. This number is the gap between the potential number of jobs reserved by the quota regulation, which is calculated from the firm size, and the actual number of employees with disabilities. $MRPL_d$ is the marginal revenue product of people with disabilities, w_i is the wages paid to disabled employees, and ϵ_i is a

fixed costs. Therefore, there is no change in the producer surplus due to fixed costs in the welfare evaluation.

distaste parameter for hiring workers with disabilities such that $\epsilon_i \sim \mathcal{N}(0, \Sigma_i^2)$.

Define the probability that a firm chooses compliance after inspection as $P_{i,c} = \Pr(U_{i,c} \geq U_{i,f})$. It can be rewritten as:

$$P_{i,c} = \Phi(\beta_0 + \beta_1 w_i + \beta_2 F_i), \tag{13}$$

in which $\beta_0 \equiv \frac{\gamma MRPL_d}{\Sigma_i}$; $\beta_1 \equiv -\frac{\gamma}{\Sigma_i}$; and $\beta_2 \equiv \frac{1}{\Sigma_i}$. Equation (13) is a probit model that can be estimated via maximum likelihood. An alternative functional form for the distaste parameter following a logistic distribution leads to similar conclusions. The marginal revenue product can be expressed as a function of estimates of β_0 and β_1 because $\hat{MRPL_d} = -\frac{\hat{\beta_0}}{\hat{\beta_1}}$.[37] Table 7 indicates that estimates of the ratio between the estimated marginal revenue product of labor and median wages are around 1.34-1.35. At best, these estimates reject that marginal revenue products of people with disabilities fall below their wages.

People with Disabilities. I next examine the changes in surplus for people with disabilities. The job surplus depends on workers' value of being employed under wage contract w, $u(w)$, relative to their unknown value of the outside option, $v(b)$. In competitive labor markets, workers get paid for their marginal product, implying a zero surplus from employment relationships. However, the high involuntary unemployment rates (Column (2) of Table A1, Appendix A) and the presence of binding minimum wages and union wage floors (Engbom and Moser, 2022) are inconsistent with perfectly competitive labor markets. Rents from employment relationships are thus likely to be positive for workers with disabilities.

If the surplus from employment is positive for people with disabilities, which labor market frictions can explain why many firms do not voluntarily hire these workers without quotas? Minimum wages and union wage floors are plausible candidates. Figure H3, Appendix H, indicates that the minimum wage is more binding among workers with disabilities than among workers without disabilities. This discrepancy could hint that firms do not hire people with disabilities because their marginal product is below the minimum wage. This hypothesis, however, is inconsistent with previous empirical findings.

[37] I use the fine schedule established in Ordinance 1,199/2003 to calculate the amount of fines that newly compliant firms would have paid if they choose non-compliance. For the firms that pay fines rather than hire workers with disabilities, The predicted wages are drawn from the distribution of wages of new hires without disabilities from low-skill white-collar and blue-collar jobs because firms cannot offer distinct wages to new workers from the same position. Standard errors are calculated using the delta method.

Instead, the findings are very consistent with discrimination at the hiring level. A large body of literature has documented employer discrimination against people with disabilities using observational or experimental evidence (Baldwin and Johnson, 1994, 2006; Baert, 2016; Ameri et al., 2018). In fictitious audit experiments in the United States randomizing information on disabilities that do not limit productivity in administrative positions, Ameri et al. (2018) find that candidates with disabilities receive way fewer callbacks for interviews than similar candidates without disabilities. In Canada, Bellemare et al. (2023) document that revealing a disability decreases callback rates by 25 percentage points and quality signals do not eliminate discrimination. The vignette experiment in my survey with HR personnel reveals a similar pattern in Brazil: Respondents are 22.2 percent less likely to express interest in hiring a candidate with disabilities.[38] Conceptually, discrimination explains why employers do not hire people with disabilities even when their marginal products are equal to or above their wages. In this case, hiring quotas can increase employment for people with disabilities without displacing workers without disabilities or shutting firms down.

Without taking a stance on the sources of labor market frictions, I translate the surplus gain of enforcing quotas for people with disabilities into a money metric gain from employment. I err on the side of caution and make additional restrictive assumptions. First, I restrict the gain to occur only in the first year of an employment spell. Second, the marginal welfare benefit is assessed assuming a linear utility function. It implies using the income flow of switching from welfare benefits to employment as the welfare gain. Third, I also account for the opportunity cost of a full-time job due to lost leisure. Following Mas and Pallais (2019), I assume a value of non-work relative to the wages of 0.58. Considering the reduced-form estimates, the (lower bound) estimated marginal welfare benefit of each inspection for people with disabilities is net positive, about 721.56 Brazilian *reais*. Appendix H provides a detailed description of the calculations.

Government. On the fiscal side, the relevant objects are the marginal cost of enforcement and the marginal fiscal revenue benefit. While there is no data available on detailed spending

[38] In the survey, respondents are assigned to a vignette describing a big fictitious consultancy that would like to hire someone for an entry-level job to do routine clerical and organizational tasks. I introduce a 22-year-old man who finished high school, has flexibility, proactivity, and good organization skills, and interacts well with people. For some respondents, I randomize the information that the man has bilateral hearing loss. I then ask respondents to rate, on a four-point scale, in which 1 is "unlikely" and 4 is "very likely", how likely they think that the company would be interested in hiring him and that he would accept the job. Table G1, Appendix G, reports the findings.

on each inspection, the average cost of inspections can provide an upper bound for the marginal cost of enforcement. The data on total expenditures on enforcement capacity reveal that the average cost of a labor inspection is around 99.29 Brazilian *reais*. Compared to the marginal revenue benefit of 801.37 Brazilian *reais* from each inspection, my results demonstrate unambiguous positive impacts.

Additional Discussion. These results together suggest that, in the presence of imperfect competition and frictions in the labor market, firms may be inefficiently small in equilibrium, and enforcing modest affirmative action hiring quotas redistributes jobs to people with disabilities and induces aggregate welfare gains. Although my data reject that the marginal revenue products of people with disabilities fall below their wages, one caveat is that I am not able to directly test whether workers with and without disabilities have the same marginal product. Recent literature has found substantial average wage markdowns, with the ratio of workers' marginal revenue product of labor to their wage ranging from 1.40 to 2.13 in other contexts (e.g., Amodio and De Roux (2021), Berger et al. (2022), Yeh et al. (2022)). In Brazil, Felix (2021) finds a ratio of 2 during the 1990s. Comparing my estimates to what other papers have documented, it might be tempting to conclude that people with disabilities have lower productivity than those without disabilities. The wide range of estimates in the literature, however, suggests great sensitivity to the context. To my knowledge, no research has investigated the differences in wage markdowns for workers with and without disabilities, let alone within the same context, and this is an important area for future work.

7 Conclusion

This paper provides a new and comprehensive assessment of the implications of enforcing affirmative action quotas for one of the most disadvantaged yet understudied groups: people with disabilities. Exploiting the timing of a reform in Brazil that enhanced enforcement of a new hiring quota regulation, my market-level analysis indicates that people with disabilities living in local labor markets more exposed to the reform experience larger increases in formal sector employment and earnings than those in less exposed local labor markets. Leveraging variation in enforcement through inspections across firms, I document that the increase in employment induced by hiring quotas does not come at a discernible cost to other workers in

terms of wages or employment or to firms, and raises fiscal revenues. My results indicate that, in labor markets characterized by discrimination at the hiring level, enforcing modest hiring quotas generates aggregate efficiency gains, constituting a promising pathway for countering the low levels of employment for the disadvantaged.

This conclusion points to new directions for future work. First, there might be strong complementarities between quotas and wage subsidies, amplifying the effects of these regulations. Second, aggressive hiring quota regulations and rigid enforcement structures might create different consequences that I do not capture here. Third, I do not exploit the optimal share of mandated employment that maximizes the efficiency gains of quotas in settings with imperfect competition. Each direction invites more research to be done since improving labor market prospects for the disadvantaged remains a policy priority in many countries.

This paper offers several other policy-relevant findings for other contexts. My findings suggest no visible costs from modest hires with disabilities. As many firms struggle to find and retain workers during the post-Covid era, reducing obstacles to employing people with disabilities is a promising approach (Ne'eman and Maestas, 2023). My analysis also points to strong complementarities between hiring quotas and enforcement capacity. In light of evidence that firms do not actively meet the minimum percentage of quotas, including federal contractors in the US (Amano-Patiño et al., 2022), my results suggest that investing in compliance seems attractive from a redistributive perspective. On the other hand, persistence of workplace inequality within firms still represents a challenge for them.

Disability hiring quotas might also generate other positive externalities beyond the job surplus. For instance, firms fostering an inclusive environment might benefit from higher diversity in teams of workers and complementarities between workers in production. Hiring quotas can promote additional social benefits, such as better health conditions and lower mortality rates due to employment, access to better health services due to crowd-out from public to private care, and lower criminal involvement. Examining whether other social benefits arise is left for future work. Therefore, this work should be viewed as an initial step toward characterizing the social benefits of hiring quotas.

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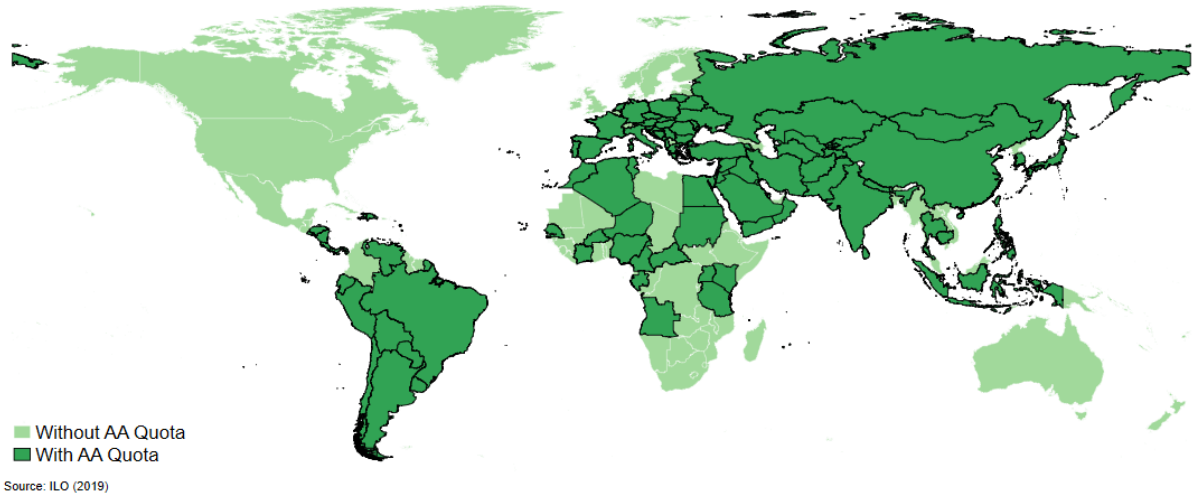
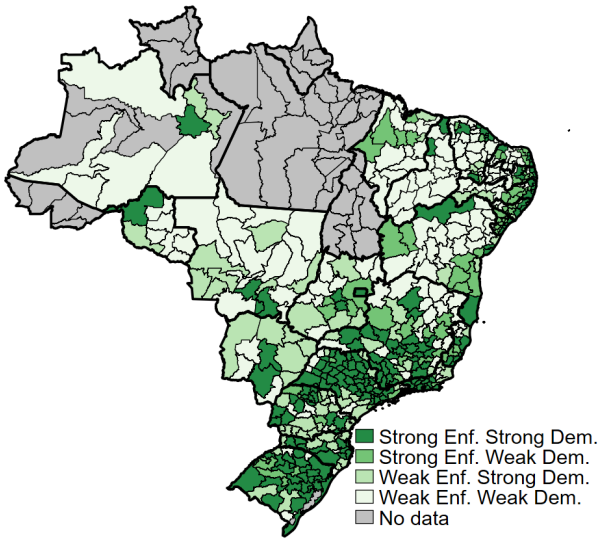
Figure 1: Countries with Disability Hiring Quotas for People with Disabilities



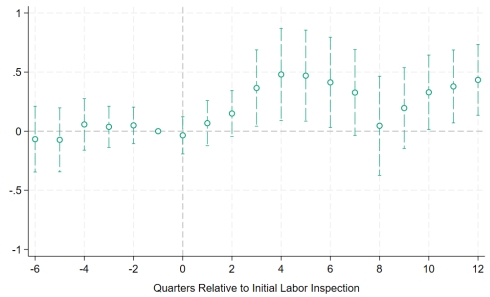
Note: This map illustrates the prevalence of affirmative action hiring quotas for people with disabilities, which are implemented in more than 100 countries. Source: ILO (2019).

Figure 2: Cross-Market Variation: Interaction between Potential Demand & Enforcement

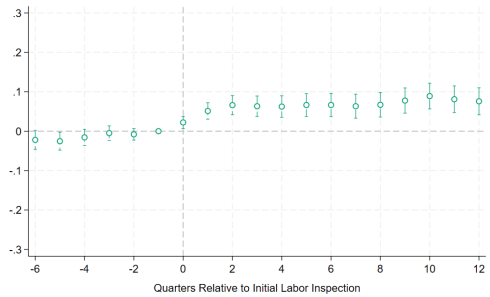


Note: Graph illustrates the geographic variation in interaction between measures of potential demand and enforcement capacity across local labor markets (micro-regions) in Brazil. Potential demand is defined as the total number of jobs in the private sector to people with disabilities if there is perfect compliance with the AA quota in 1998, which are calculated from the distribution of firm size, divided by the total number of people with disabilities in 2000. Enforcement capacity is proxied by the minimum distance to the nearest labor office belonging to the same state within each micro-region. Sources: 1998 RAIS, 2000 Demographic Census data, and labor offices' addresses.

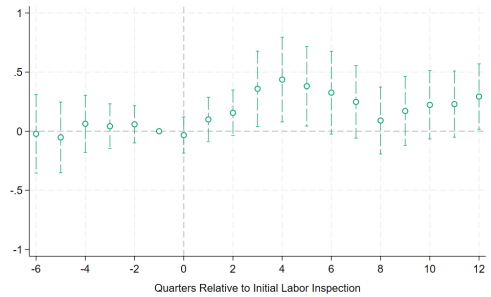
Figure 3: The Firm-Level Effects of AA Quotas



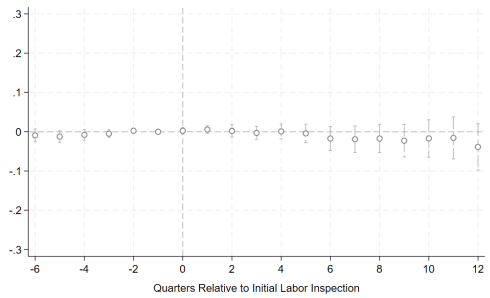
(a) Workers with Disabilities



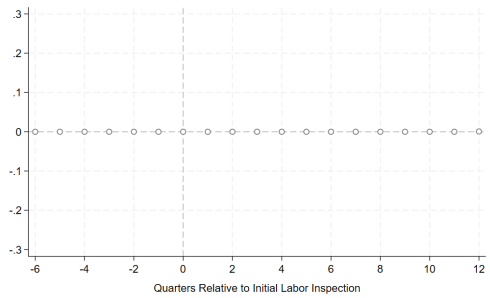
(b) Have at Least One Worker with Disabilities



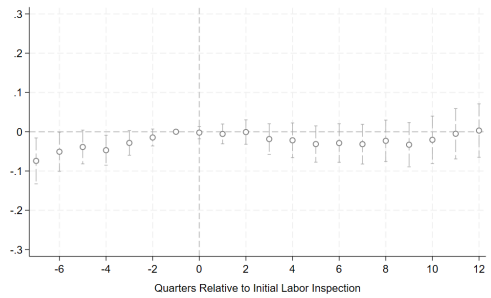
(c) Share of Workers with Disabilities



(d) Log Average Wages



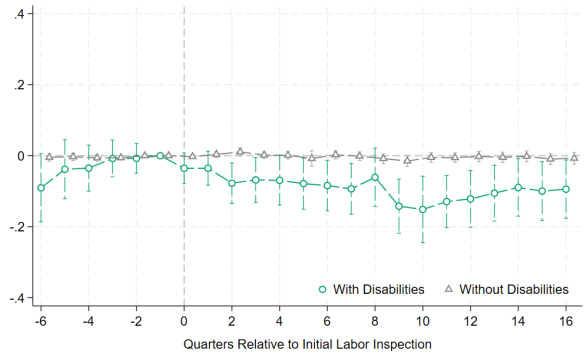
(e) Exit



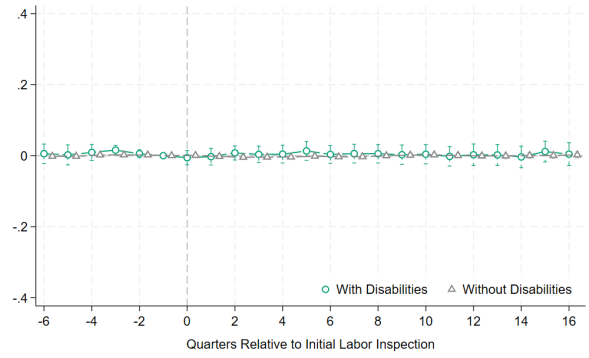
(f) Log Workers without Disabilities

Note: This figure reports point estimates of the quarterly effects of the AA quota on employment of people with disabilities considering the intensive (total number of workers with disabilities) and extensive margins (indicator for having at least one worker with disabilities), and the share of workers with disabilities (defined as total workers with disabilities divided by the total number of workers). On the bottom panel, this figure reports point estimates of the quarterly effects of the AA quota on log average wages, exit, and log workers without disabilities. More details can be found in Table 3.

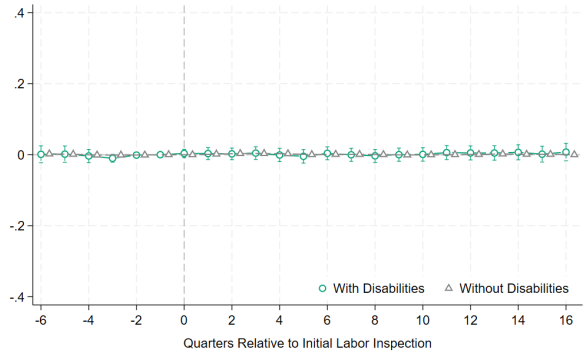
Figure 4: The Worker-Level Effects of AA Quotas



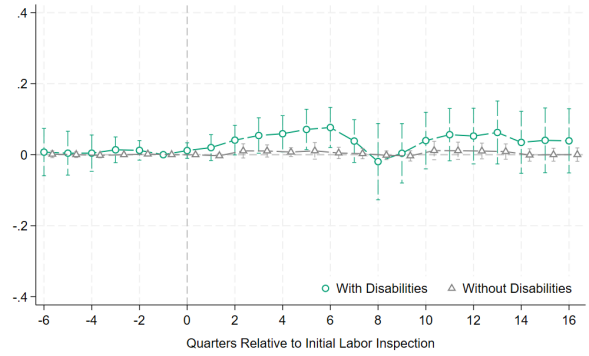
(a) Log Hourly Wages



(b) Log Number of Contracted Hours



(c) Part-Time Employment



(d) Turnover

Note: This figure reports point estimates of the quarterly effects of the AA quota on the log hourly wages, the log number of contracted hours, the likelihood of part-time employment, and the likelihood of staying at the firm. More details can be found in Table 5.

Table 1: Aggregate Analysis: Impacts on Employment

	(1)	(2)	(3)	(4)
	With Disabilities		Without Disabilities	
	Formal Employment	Informal Employment	Formal Employment	Informal Employment
(Strong Demand & Strong Enforcement) × Reform	0.011***	-0.003	0.006	0.005
	(0.004)	(0.004)	(0.004)	(0.004)
(Strong Demand & Weak Enforcement) × Reform	0.002	-0.006	0.002	0.004
	(0.004)	(0.004)	(0.005)	(0.004)
(Weak Demand & Strong Enforcement) × Reform	0.004	-0.003	0.004	0.000
	(0.004)	(0.004)	(0.004)	(0.004)
Sample Size	1,116	1,116	1,116	1,116
Mean Dep. Var. (in 2000)	0.117	0.148	0.192	0.205
Mean Dep. Var.	0.145	0.144	0.231	0.183

Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports the aggregate effects of the reform on formal and informal employment rates for people with disabilities (Columns (1) and (2)) and people without disabilities (Columns (3) and (4)). All columns refer to Equation (2). Means of dependent variables are computed from all micro-regions. Standard errors are clustered at the micro-region level.

Table 2: Aggregate Analysis: Impacts on Earnings

	(1)	(2)	(3)	(4)
	With Disabilities		Without Disabilities	
	Work Income	Non-Work Income	Work Income	Non-Work Income
(Strong Demand & Strong Enforcement) × Reform	26.115**	-6.033	9.123	-4.429
	(12.365)	(5.237)	(9.932)	(3.304)
(Strong Demand & Weak Enforcement) × Reform	13.366	-2.051	7.446	-5.467
	(20.914)	(5.349)	(12.153)	(4.799)
(Weak Demand & Strong Enforcement) × Reform	-10.369	3.836	6.272	-4.542
	(10.775)	(3.915)	(9.387)	(3.062)
Sample Size	1,116	1,116	1,116	1,116
Mean Dep. Var. (in 2000)	367.17	119.88	638.17	70.23
Mean Dep. Var.	401.98	142.94	689.70	81.33

Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports the aggregate effects of the reform on earnings, measured as work and non-work income, for people with disabilities (Columns (1) and (2)) and people without disabilities (Columns (3) and (4)). All columns refer to Equation (2). Means of dependent variables are computed from all micro-regions. Standard errors are clustered at the micro-region level.

Table 3: Effects of AA Quotas on Employment Outcomes

	(1) Workers with Disabilities	(2) Have at Least One Worker with Disabilities	(3) Share of Workers with Disabilities	(4) Log Average Wages	(5) Exit	(6) Log Workers without Disabilities
Panel A: Dynamic Impacts						
Immediate ($k = 0$)	-0.035	0.022***	-0.033	0.003	-0.000	-0.002
	(0.080)	(0.008)	(0.078)	(0.004)	(0.000)	(0.008)
Short Run ($k = 6$)	0.413**	0.066***	0.326*	-0.017	0.000	-0.029
	(0.194)	(0.015)	(0.179)	(0.016)	(0.000)	(0.025)
Long Run ($k = 12$)	0.434***	0.076***	0.293**	-0.039	0.001	0.003
	(0.153)	(0.017)	(0.141)	(0.030)	(0.001)	(0.035)
Panel B: Aggregate Impacts						
Post × Quota	0.313***	0.079***	0.234**	-0.007	0.000	0.013
	(0.109)	(0.011)	(0.104)	(0.012)	(0.000)	(0.024)
Sample Size	65,580	65,580	65,580	65,580	77,120	65,580
Firm and Year FEs	✓	✓	✓	✓	✓	✓
State and Industry Trends	✓	✓	✓	✓	✓	✓
# Firms	3,279	3,279	3,279	3,279	3,856	3,279
Mean Dep. Var (Control)	0.310	0.087	0.383	7.474	0	4.235

Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports the firm-level effects of the AA quota on several outcomes: total number of workers with disabilities, indicator for having at least one worker with disabilities, share of workers with disabilities relative to the total number of workers, log average wages, firm exit, and log workers without disabilities. All columns refer to Equation (4). Means of dependent variables are computed from the control group in the quarterly window [-6, -1] before inspection. Standard errors are clustered at the firm level.

Table 4: Effects of AA Quotas on Wages

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Dynamic Impacts (With Disabilities) (N = 42,043)						
Immediate ($k = 0$)	-0.024	-0.033	-0.031	-0.035	-0.008	0.102
	(0.023)	(0.023)	(0.022)	(0.022)	(0.017)	(0.114)
Short Run ($k = 6$)	-0.103**	-0.084**	-0.101**	-0.084**	-0.062*	-0.016
	(0.042)	(0.037)	(0.041)	(0.036)	(0.037)	(0.103)
Long Run ($k = 12$)	-0.131***	-0.120***	-0.132***	-0.122***	-0.088*	-0.028
	(0.045)	(0.042)	(0.043)	(0.041)	(0.050)	(0.099)
Panel B: Aggregate Impacts (With Disabilities) (N = 42,043)						
Post × Quota	-0.072**	-0.059*	-0.068**	-0.057*	-0.049	-0.038
	(0.033)	(0.031)	(0.033)	(0.031)	(0.034)	(0.061)
Panel C: Dynamic Impacts (Without Disabilities) (N = 8,155,725)						
Immediate ($k = 0$)	-0.001	-0.002	-0.001	-0.003	-0.001	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.010)
Short Run ($k = 6$)	0.006	0.005	0.001	0.002	0.004	-0.010
	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)	(0.013)
Long Run ($k = 12$)	-0.005	-0.002	-0.004	-0.002	0.005	-0.019
	(0.009)	(0.008)	(0.008)	(0.007)	(0.008)	(0.017)
Panel D: Aggregate Impacts (Without Disabilities) (N = 8,155,725)						
Post × Quota	0.000	0.002	-0.002	0.000	0.001	-0.008
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Firm and Quarter FEs	✓	✓	✓	✓	✓	✓
State and Industry Trends	✓	✓	✓	✓	✓	✓
Individual Controls		✓		✓		✓
Occupation FE			✓	✓		✓
Worker FE					✓	
Sample						New Hires

Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports the worker-level effects of the AA quota on log hourly wages for workers with (Panels A and B) and without (Panels C and D) disabilities. Panels A and C refer to event-study difference-in-differences from Equation (5), while Panels B and D report aggregate difference-in-differences estimates from Equation (6). Column (1) refers to a model with firm and quarter fixed effects and state and industry trends. Column (2) adds individual controls (gender, race, educational level fixed effects, age, and square age). Column (3) includes occupation fixed effects. Column (4) refers to the preferred specification described in Equation (6). Column (5) includes worker, firm and quarter fixed effects, along with state and industry trends. Column (6) has the same specification as Column (4) with the sample restricted to new hires. Standard errors are clustered at the firm level.

Table 5: Effects of AA Quotas on Workers' Outcomes

	(1) Log Hours	(2) Part-Time	(3) Turnover
Panel A: Dynamic Impacts (With Disabilities) (N = 42,043)			
Immediate ($k = 0$)	-0.006	0.004	0.012
	(0.010)	(0.006)	(0.011)
Short Run ($k = 6$)	0.004	0.004	0.077***
	(0.013)	(0.009)	(0.029)
Long Run ($k = 12$)	0.003	0.005	0.052
	(0.015)	(0.010)	(0.040)
Panel B: Aggregate Impacts (With Disabilities) (N = 42,043)			
Post × Quota	0.002	0.001	0.034
	(0.013)	(0.009)	(0.024)
Panel C: Dynamic Impacts (Without Disabilities) (N = 8,155,725)			
Immediate ($k = 0$)	0.001	-0.000	-0.000
	(0.001)	(0.001)	(0.002)
Short Run ($k = 6$)	-0.003	0.001	0.005
	(0.003)	(0.002)	(0.008)
Long Run ($k = 12$)	-0.001	0.001	0.010
	(0.004)	(0.002)	(0.011)
Panel D: Aggregate Impacts (Without Disabilities) (N = 8,155,725)			
Post × Quota	-0.001	0.001	0.004
	(0.003)	(0.002)	(0.006)
Firm and Quarter FEs	✓	✓	✓
State and Industry Trends	✓	✓	✓
Individual Controls	✓	✓	
Occupation FE	✓	✓	
Worker FE			✓

Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports the worker-level effects of the AA quota on log contracted hours, the likelihood of having a part-time job, and the likelihood of promotion. Results are reported for workers with (Panels A and B) and without disabilities (Panels C and D) separately. Panels A and C refer to the preferred specification described in Equation (6), whereas Panels B and D refer to Equation (5). The only exception is Column (3): the specification for the likelihood of staying at the firm considers worker, firm and quarter fixed effects and state- and industry-specific trends. Standard errors are clustered at the firm level.

Table 6: Heterogeneity: Effects of AA Quotas on Wages

	(1)	(2)	(3)	(4)
	Educational Level		**Interpersonal Relationship**	
Panel A: Dynamic Impacts				
Immediate ($k = 0$)	-0.040*	-0.005	-0.049**	-0.028
	(0.023)	(0.039)	(0.023)	(0.037)
Short Run ($k = 6$)	-0.112**	-0.037	-0.108*	-0.056
	(0.055)	(0.055)	(0.062)	(0.047)
Long Run ($k = 12$)	-0.147**	-0.029	-0.151**	-0.064
	(0.065)	(0.058)	(0.063)	(0.055)
Panel B: Aggregate Impacts				
Post × Quota	-0.086*	0.026	-0.070	-0.032
	(0.045)	(0.045)	(0.047)	(0.039)
Sample Size	19,560	19,108	21,264	20,300
Sample Restriction	No High School	Has High School	Below Median	Above Median

Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports the heterogeneous effects of the AA quota on log hourly wages for workers with disabilities. Columns (1) and (2) restrict the samples to workers without and with a high school diploma. Columns (3) and (4) refer to samples of workers in jobs with weak and strong interpersonal relationships. All columns refer to specifications with firm and quarter fixed effects, state and industry trends, and occupation fixed effects. Standard errors are clustered at the firm level.

Table 7: Discrete Choice Estimates

	(1)	(2)
$\hat{\beta}_0$	0.4549***	1.4339***
	(0.0667)	(0.1575)
$\hat{\beta}_1$	-0.0002***	-0.0006***
	(0.0000)	(0.0001)
$\hat{MRPL}_d$	2,383.908	2,400.909
	(256.17)	(166.90)
Median Wages	1,783.05	1,783.05
$\hat{MRPL}_d/w$	1.3370	1.3465
[Lower Bound; Upper Bound]	[1.0554; 1.6186]	[1.1631; 1.5300]
Model	Probit	Logit

Note: This table reports estimates from Equation (13) with probit (Column (1)) and logit (Column (2)) models. $\hat{MRPL}_d/\bar{w}$ is defined as the ratio between firms' estimated monthly marginal revenue product of labor and median wages. Lower and upper bounds with 95-percent confidence intervals are calculated. Standard errors are computed using the delta method.

ONLINE APPENDIX

A Institutional Context and Data

A.1 The Disability Gaps in Brazil

Table A1: Disability Gaps in the Brazilian Labor Market

	(1) Economically Active	(2) Unemployment	(3) Informal Employment	(4) (IHS) Work Income
Severe Difficulty	-0.190***	0.064***	0.033***	-0.201***
	(0.008)	(0.004)	(0.002)	(0.009)
Some Difficulty	-0.049***	0.046***	0.021***	-0.128***
	(0.005)	(0.002)	(0.002)	(0.004)
Sample Size	7,585,979	5,578,631	5,105,431	5,105,431
Sample Restriction	-	Econ. Active	Worked	Worked
Mean (Without Disabilities)	0.788	0.068	0.184	7.438
Mean (Severe Difficulty)	0.553	0.157	0.255	7.029
Mean (Some Difficulty)	0.700	0.131	0.237	7.127
Individual Controls	✓	✓	✓	✓
Occup. & Sector Controls	×	✓	✓	✓

Note: This table displays gaps in labor market outcomes across disabilities using the 2010 Census. The samples include working-age individuals aged 25 to 54. To capture severe disabilities, I create an indicator variable for whether individuals report having a permanent intellectual disability or having severe difficulties in one or more of the following activities: seeing, hearing, walking, or climbing stairs. To capture some disabilities, I create an indicator variable for whether individuals report having some difficulties in hearing, walking, or climbing stairs. I regress labor market outcomes on having severe and some difficulties. The omitted disability group is no disabilities (no difficulties). All specifications include potential experience, potential experience squared, dummies for educational categories and rural areas, and municipality fixed effects. Columns (2) to (4) additionally include occupation and economic sector fixed effects. The dependent variables are indicators for economically active individuals, unemployment in the last week of July of 2010, employment in the informal sector, and the inverse hyperbolic sine transformation of work income. Column (2) further restricts the sample to economically active individuals. In Columns (3) and (4), the sample refers to individuals who have worked in the last week of July 2010. Means of dependent variables across disability groups are reported. Standard errors are clustered at the state level.

A.2 List of Disabilities

As explained in Section 2.2, the Anti-Discrimination Act (Article 4) provides a list of disabilities that qualify for reserved jobs from the AA quota regulation. Throughout the years, this list has been modified to include other disabilities to accommodate decisions made by the Ministry of Labor, Labor Courthouses (*Justiça do Trabalho*), and Supreme Courts. The list of disabilities includes:

Physical Disabilities. Complete or partial alteration of one or more segments of the human body, causing impairment of physical function. Examples can include paraplegia, paraparesis, monoplegia, monoparesis, tetraplegia, tetraparesis, triplegia, triparesis, hemiplegia, hemiparesis, ostomy, amputation or absence of a limb, cerebral palsy, dwarfism, limbs with congenital or acquired deformity, except for aesthetic deformities and those that do not lead to difficulties at work. People with reduced mobility may also qualify for the AA quota.

Hearing Loss. Bilateral (partial or total) loss of 41 decibels (dB) or more, measured by an audiogram test at frequencies of 500HZ, 1000HZ, 2000Hz, and 3000Hz. It is equivalent to moderate to profound hearing loss.

Blindness and Vision Impairment. Blindness (visual acuity equal to or less than 0.05 in the best eye with the best optical correction); low vision (visual acuity between 0.3 and 0.05 in the best eye with the best optical correction); cases in which the sum of the visual field measured in both eyes is equal to or less than 60 degrees; simultaneous occurrence of any of the previous conditions; and monocular vision (visual acuity equal to or less than 0.05 in one eye with the best optical correction). Monocular vision was added to the list in 2011 (CONJUR/MTE 444/11).

Cognitive Disorders. Permanent cognitive or mental disorders that create limitations in two or more of the following skills: communication, personal care, social skills, use of community resources, health and safety, academic skills, leisure, and work. Examples include learning disabilities (e.g., dyscalculia) and autism spectrum disorder. The latter was added to the list in 2012 (Law 12,764).

Multiple Disabilities. Multiple disabilities encompass two or more disabilities.

A.3 Timeline of Implementation and Enforcement of the AA Quota

July 1991. The AA quota was first launched in 1991 with Law 8,213 as part of the social security reform. Because the Law did not specify the disabilities that would qualify for the job reserved to the AA quota, nor the guidelines to ensure oversight and enforcement of the AA quota, it was largely ineffectual (Costilla et al., 2002).

December 1999. The National Policy for People with Disabilities (Decree 3,298) is enacted. The new regulation consisted of a set of guidelines for ensuring the rights and integration of people with disabilities into society. Relevant to this paper, Chapter I and Section IV of the Decree defined a list of disabilities (see Appendix A.2) and assigned to the Ministry of Labor the responsibility of oversight and enforcement, through labor inspections, of the AA quota.

January 2001. The Ministry of Labor issued the Normative Instruction SIT 20 establishing, for the first time, that all labor inspections would assess compliance with the AA quota. This normative instruction also guided how inspectors should determine which firms are subject to the AA quota.

October 2003. To promote enforcement and compliance with the AA quota, the Ministry of Labor issued the *Portaria* 1,199. It established, for the first time, administrative fines and penalties for non-compliance.

August 2012. The Ministry of Labor issued the Normative Instruction SIT 98 creating the possibility of special and targeted inspections specifically aimed at compliance with the AA quota.

July 2015. The federal government enacted Law 12,146, known as the Brazilian Inclusion Law (or Statute of Persons with Disabilities), which established a set of rights for people with disabilities and a new approach to defining disabilities. In particular, the country adopted a social approach, rather than a medical approach, to characterize persons with disabilities. Article 5 of the Law also stated that "persons with disabilities shall be protected from all forms of neglect, discrimination, exploitation, violence, torture, cruelty oppression, and inhuman or degrading treatment".

A.4 Data Appendix

The Labor Market Data. The *Relação Anual de Informações Sociais* (RAIS) is the main labor market data source. RAIS is a linked employer-employee register containing worker and firm tax identifiers, allowing me to construct firm- and worker-level samples. The raw data are mostly provided in state-year files and all variables are standardized across years. I use data spanning the years between 2003, the first year in which information on disability status started to be collected from employers, and 2018. Information on the type of disability has been available since 2006 and consists of six categories: physical, hearing, visual, intellectual, multiple, and rehabilitated.

The Census Data. The Brazilian Demographic Census is released every 10 years and provides a complete overview of the Brazilian population, including those outside the formal sector. I use data from 2000 and 2010. Records from the 2022 Census, whose records are not yet available, have a different set of questions concerning disabilities, making them incomparable to prior editions.

Disability. Information on disabilities started to be collected in the 1991 edition, which asked individuals who identify themselves as having disabilities whether they have one of the following conditions: (i) blindness; (ii) deafness; (iii) paralysis on one side (hemiplegia); (iv) paralysis of the legs (paraplegia); (v) total paralysis (quadriplegia); (vi) lack of member(s) or part thereof (person who does not have one of the upper or lower limbs, or both, since birth or by amputation due to illness or accident); (vii) intellectual disability since childhood; (viii) multiple disabilities (two or more of the previous disabilities); (ix) none of the above. Only 1.23 percent of the working-age population reported having disabilities.

Following methodologies from the Washington Group on Disability Statistics, the 2000 and 2010 Census editions added a new set of questions. These Censuses asked four questions related to disabilities: (i) whether the individual has permanent intellectual disabilities that limit regular activities, such as working or attending school; (ii) how challenging is for the individual to see; (iii) how challenging is for the individual to hear; (iv) how challenging is for the individual to walk or climb stairs. For questions (ii), (iii), and (iv), individuals had four options as answers: unable to do this activity, very challenging, somewhat challenging, and not challenging. [39] 12.45 and 17.23 percent of the working-age population disclosed that

[39] Although the 2000 Census asked whether individuals have one of the following disabilities: total and permanent paralysis (quadriplegia), permanent paralysis of the legs (paraplegia), permanent paralysis on

these activities were somewhat challenging in the 2000 and 2010 Censuses, while 3.90 and 6.68 percent reported that they were unable to do these activities or found these activities very challenging. Alternative statistics that exclude seeing from the list of somewhat challenging activities reveal that 4.48 and 6.11 percent of individuals reported having some form of disabilities in 2000 and 2010. Importantly, my empirical analysis excludes the 1991 edition due to sizable inconsistencies in methodologies and the incidence of disabilities.

Labor market information. To ensure that labor market information is comparable across the 2000 and 2010 Census editions, I rely on questions that are asked similarly in both Census waves. Relevant to Tables 1 and 2, I generate the following variables for individuals with and without disabilities: (i) *formal employment*; (ii) *informal employment*; (iii) *work income* (income from main and secondary works); (iv) *non-work income* (e.g., retirement, pension, rents, alimony, donations, welfare programs, unemployment insurance, and other sources).

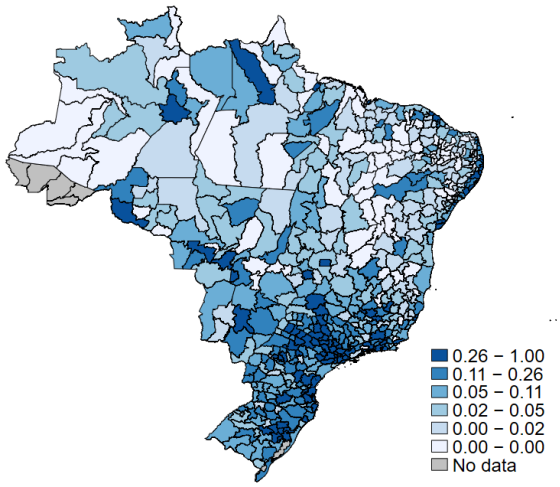
To assess hours responses in Table C3, I consider two alternative measures: (i) *conditional hours*, which corresponds to the weekly hours worked at the main job; and (ii) *unconditional hours*, in which I assign zero hours to individuals who do not report any weekly hours worked.

Other information. Table C3 consider two other outcomes: (i) migration (indicator variable for individuals that report having moved to another state in the last five years); and (ii) welfare program (indicator variable for individuals that report receiving welfare benefits from the government).

one side (hemiplegia), or lack of member(s) or part thereof, the 2010 Census did not include this question. Therefore, I do not incorporate this question into my empirical analysis in Section 4.

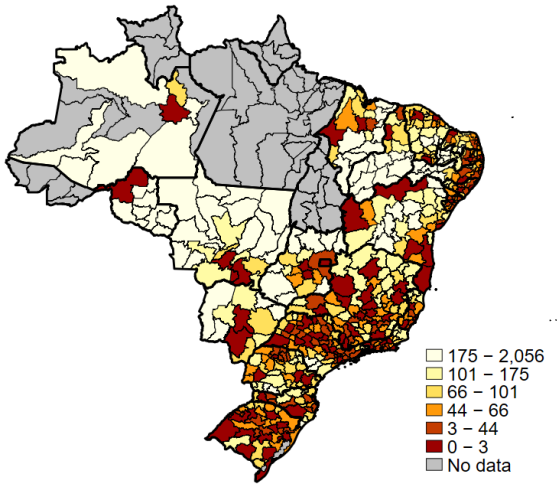
B Figures (Aggregate Analysis)

Figure B1: Cross-Market Variation: Potential Demand



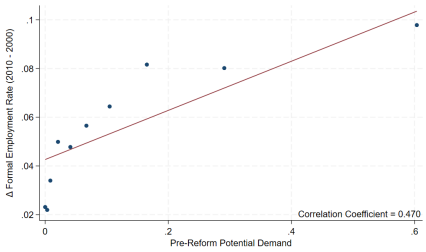
Note: Graph illustrates the geographic variation in potential demand measure across local labor markets (micro-regions) in Brazil. Potential demand is defined as the total number of jobs in the private sector that would be available due to the hiring quota regulation in 1998, which is calculated from the distribution of firm size, divided by the total number of people with disabilities in 2000. Sources: 1998 RAIS and 2000 Demographic Census data.

Figure B2: Cross-Market Variation: Enforcement Capacity



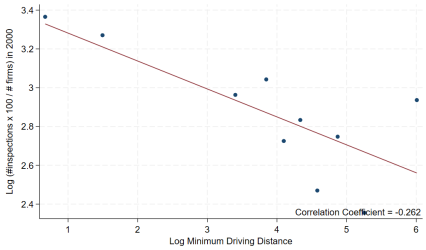
Note: Graph illustrates the geographic variation in enforcement capacity across local labor markets (micro-regions) in Brazil. Enforcement capacity is computed by obtaining the driving distance between the centroid of each municipality and the nearest labor office created prior to the 2000s. I then define the minimum distance of the municipalities that belong to each micro-region as the minimum distance between each micro-region and the nearest labor office. Sources: Data on labor offices from the Ministry of Labor and from Ponczek and Ulyssea (2021).

Figure B3: Pre-Reform Potential Demand and Actual Employment Rate



Note: This binned scatter plot shows the relationship between the pre-reform potential demand and the increase in employment rate in the formal sector for people with disabilities between 2000 and 2010. The former is defined as the total number of jobs in the private sector that would be available due to the hiring quota regulation in 1998, which is calculated from the distribution of firm size, divided by the total number of people with disabilities in 2000. The latter is defined as the share of formal employment in 2010 relative to 2000. The unit of observation is a micro-region. The right-hand side variable is grouped into 10 bins. The correlation coefficient is 0.470. Sources: 1998 RAIS and 2000 and 2010 Demographic Census data.

Figure B4: Pre-Reform Driving Distance to Labor Offices and Frequency of Inspections



Note: This binned scatter plot shows the relationship between the pre-reform distance to the nearest labor office and the frequency of labor inspections in 2000. The former is defined as the minimum driving distance between each micro-region and the nearest labor office. The latter is defined as a log of the total number of inspections normalized by the number of firms in each micro-region in 2000. The unit of observation is a micro-region. The right-hand side variable is grouped into 10 bins. The correlation coefficient is -0.262. Sources: Data on labor offices (from the Ministry of Labor and from Ponczek and Ulyssea (2021) and data on labor inspections.

Figure B5: Impact of the 2000 Reform on Formal Employment of People with Disabilities

Note: This figure reports point estimates of the annual effects of the 2000 reform on the share of formal employment of people with disabilities using both the RAIS and Census data. The numerator and denominator are constructed from RAIS (2006 records are excluded due to reporting inconsistencies) and Census records. The omitted category is micro-regions with weak enforcement and weak demand in 2000.

C Tables (Aggregate Analysis)

Table C1: Descriptive Statistics at the Micro Region Level

	(1) Mean	(2) SD
Panel A: People Without Disabilities		
Formal Employment	0.191	0.099
Informal Employment	0.204	0.048
Work Income (in BRL *reais*)	641.41	318.40
Non-Work Income (in BRL *reais*)	74.22	41.28
Panel B: People With Disabilities		
Formal Employment	0.116	0.065
Informal Employment	0.146	0.041
Work Income (in BRL *reais*)	363.78	211.90
Non-Work Income (in BRL *reais*)	125.32	57.65
Panel C: Demographic and Economic Variables		
Share Female	0.498	0.012
Share College Educated	0.035	0.028
Share Urban	0.679	0.180
Unemployment Rate	0.111	0.039
Income *per capita* (in BRL *reais*)	397.16	211.05
Population	36,334.07	81,152.06
Number of Micro Regions	509	

Note: This table reports descriptive statistics (mean and standard deviation) in 2000 at the micro region level. Shares of formal and informal employment, average work and non-work incomes, shares of female, college educated, and urban population, unemployment rate, average income per capita, and average population are computed using individual-level data and sampling weights from the 2000 Census data.

Table C2: Aggregate Analysis: Impacts on Formal and Informal Work Income

	(1)	(2)	(3)	(4)
	With Disabilities		Without Disabilities	
	Formal	Informal	Formal	Informal
(Strong Demand & Strong Enforcement) × Reform	10.188*	-5.014	7.523	-5.014
	(5.221)	(3.093)	(6.725)	(3.093)
(Strong Demand & Weak Enforcement) × Reform	9.756	-6.632	11.191	-6.632
	(7.510)	(4.860)	(7.249)	(4.860)
(Weak Demand & Strong Enforcement) × Reform	1.619	-6.333*	8.093	-6.333*
	(4.516)	(3.235)	(6.289)	(3.235)
Sample Size	1,116	1,116	1,116	1,116
Mean Dep. Var. (in 2000)	103.55	81.83	192.77	143.53
Mean Dep. Var.	135.94	75.41	247.29	119.59

Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports the aggregate effects of reform on formal and informal work income for people with disabilities (Columns (1) and (2)) and people without disabilities (Columns (3) and (4)). All columns refer to Equation (2). Means of dependent variables are computed from all micro-regions. Standard errors are clustered at the micro-region level.

Table C3: Impacts on Migration, Hours Worked, and Welfare Program Take-Up

	(1)	(2)	(3)	(4)
	Interstate Migration	Conditional Hours	Unconditional Hours	Welfare Program
(Strong Demand & Strong Enforcement) × Reform	0.001	0.259	0.594**	-0.021***
	(0.002)	(0.286)	(0.267)	(0.004)
(Strong Demand & Weak Enforcement) × Reform	0.001	0.229	-0.153	-0.007
	(0.002)	(0.289)	(0.307)	(0.004)
(Weak Demand & Strong Enforcement) × Reform	0.000	0.357	-0.057	-0.011**
	(0.002)	(0.317)	(0.277)	(0.005)
Sample Size	1,116	1,116	1,116	1,116
Mean Dep. Var. (in 2000)	0.031	43.31	21.46	0.012
Mean Dep. Var.	0.028	41.30	21.84	0.095

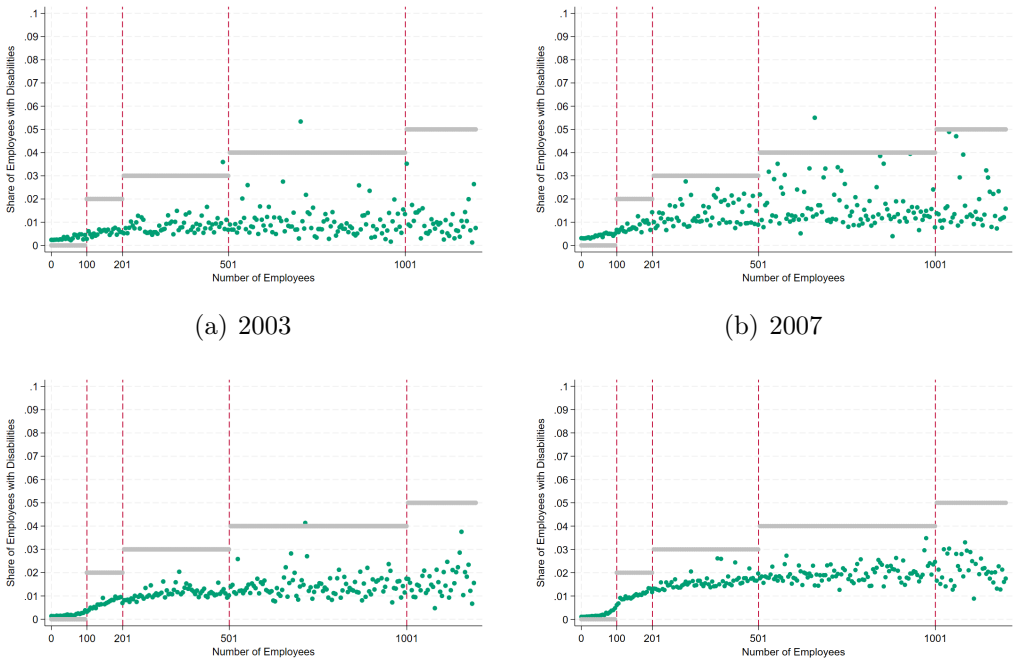
Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports the aggregate effects of reform on the interstate migration rate, the (conditional and unconditional) number of hours workers, and the likelihood of receiving a welfare program for people with disabilities. Migration is defined as having moved to another state in the last five years. Conditional hours correspond to the weekly hours worked at the main job, whereas unconditional hours assign zero hours to individuals who do not report any weekly hours worked. All columns refer to Equation (2). Means of dependent variables are computed from all micro-regions. Standard errors are clustered at the micro-region level.

D Firm-Level Analysis: Alternative Empirical Strategies

D.1 Regression Discontinuity Design

The institutional context described in Section 2.2 suggests that a natural candidate to estimate the causal impacts of disability hiring quotas is the regression discontinuity design. Firms in the formal private sector with at least 100 employees to fill a minimum of 2 percent of positions with people with disabilities or individuals enrolled in a vocational rehabilitation program. The reserved share increases in firm size: Firms with 201 to 500 (501 to 1,000) employees must meet a quota of 3 percent (4 percent), while those with more than 1,000 employees have a quota of 5 percent. The data, however, reveals that firms do not comply with disability hiring quotas without labor inspections. Figure D1 confirms the lack of clear discontinuities in the share of employees with disabilities near the cutoff requirements between 2003 and 2015 to employ regression discontinuity designs.

Figure D1: Regression Discontinuity Design: No First-Stage



(a) 2003 (b) 2007

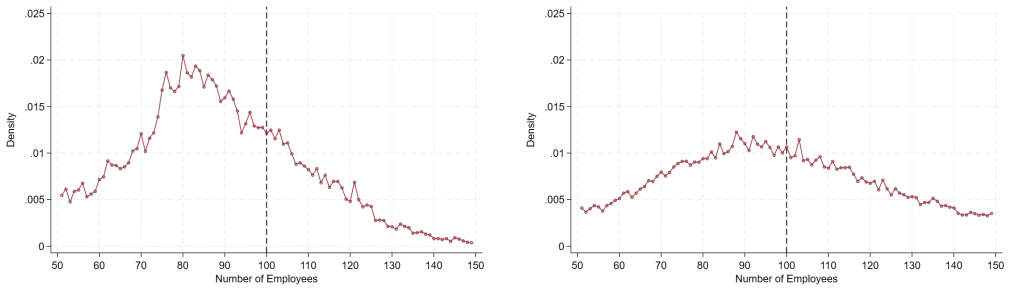
(c) 2011 (d) 2015

Note: This figure reports the share of employees with disabilities across the running variable using four years of RAIS data: 2003, 2007, 2011, and 2015. The running variable is defined as the number of employees at the firm by the end of each year. Red dashed lines represent the cutoff requirements. Grey horizontal lines display the counterfactual share of employees with disabilities in case of full compliance with hiring quotas.

D.2 Bunching

Another potential candidate is the bunching method. Firms might perceive the disability hiring quotas as a costly regulation and avoid them by bunching below or over the cutoff requirements. Figure D2 corroborates the lack of evidence that firms endogenously respond to the discontinuities in disability hiring quotas, either before or after labor inspections, reinforcing that the 2 percent hiring quotas are not costly to firms.

Figure D2: No Evidence of Bunching



(a) Pre-Inspection Period (b) Post-Inspection Period

Note: Figures display the distribution of workers for all firms in the estimation sample before and after the labor inspections, using a bin size of one. Sources: RAIS and data on inspections.

D.3 Other Cutoffs

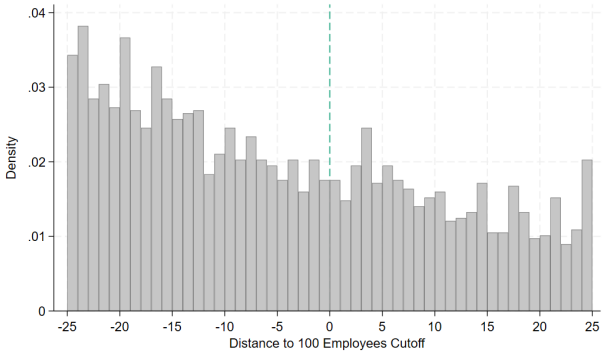
Section 5 revolves around the *extensive* margin of modest quotas by comparing treated firms with slightly more than 100 employees and, therefore, are assessed for compliance with the disability hiring quotas of 2 percent to control firms that are not required to hire people with disabilities. The estimates are interpreted as the impact of enforcing modest (extensive margins of) disability hiring quotas. The institutional context, however, also raises the possibility of assessing the causal impacts of other *intensive* margins of quotas by exploiting the cutoffs of 200, 500, and 1000 employees.

The sample of firms with pre-inspection employment levels between 150 and 250, 450 and 550, and 950 and 1050 employees is too small, with 774, 50, and 6 firms. With a pooled sample and an alternative version of Equation (3), in which $Quota_{j,pre}$ is an indicator variable equal to one for pooled firms with more than 200, 500, and 1,000 employees before inspection, and the post-event coefficients — β_k^{Quota} — should be interpreted as the dynamic effects of

enforcing an additional 1 percentage point requirement to hire workers with disabilities, I find that, qualitatively, the results point to increases in the employment of people with disabilities. However, the large standard errors due to the small sample size do not allow me to rule out zero effects.

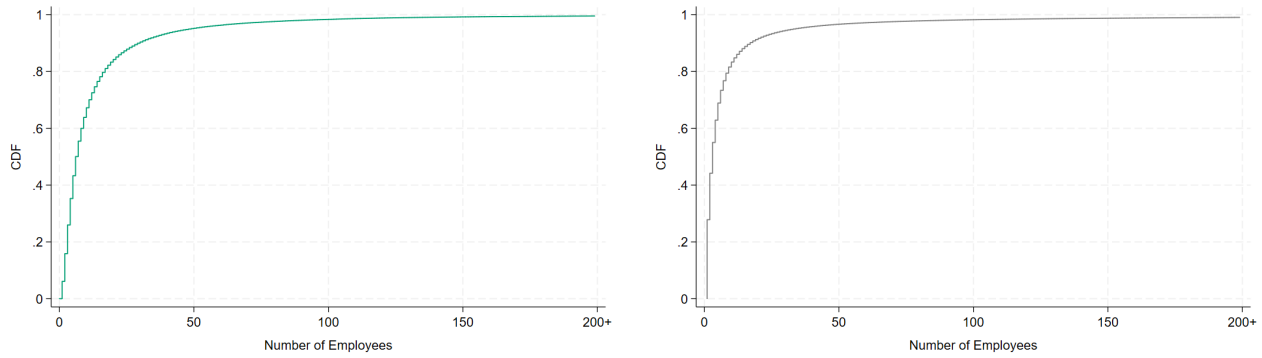
E Figures (Firm- and Worker-Level Analyses)

Figure E1: Histogram



Note: Histogram depicts the distribution of firm size, measured by total number of employees, relative to the affirmative action quota cutoff of 100 employees within one point bins. Further details about the sample can be found in Table F2. Sources: RAIS and data on inspections.

Figure E2: Cumulative Distribution Function of Firm Size

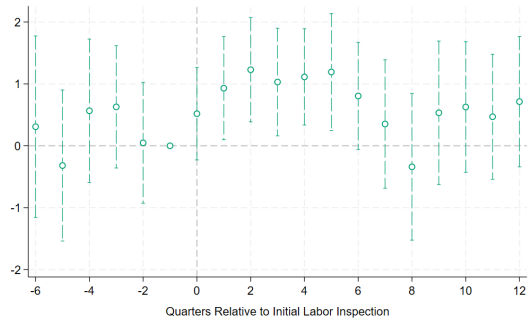


(a) Inspected Firms

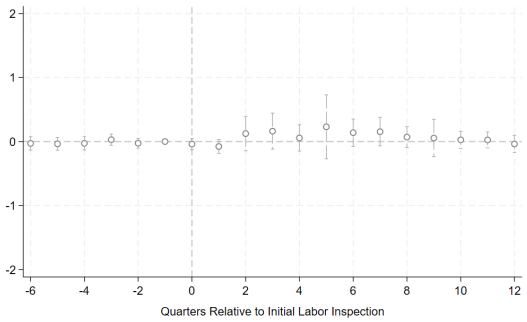
(b) All Firms

Note: This figure reports cumulative distribution functions of firm size. On the right, I consider the sample of inspected firms. On the left, I consider the universe of formal firms in 2003. Sources: RAIS and data on inspections.

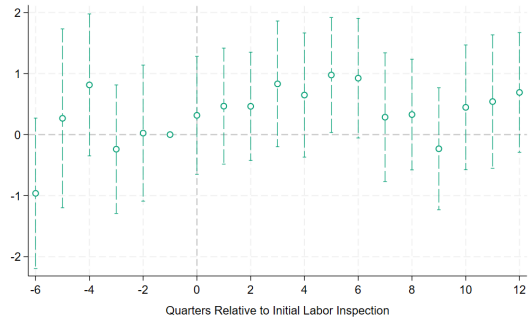
Figure E3: Effects of AA Quotas on New Hires and Separations



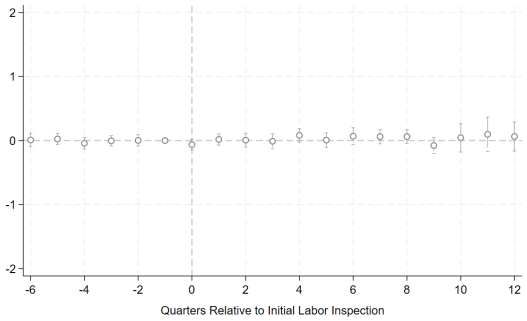
(a) Hires with Disabilities



(b) Hires without Disabilities



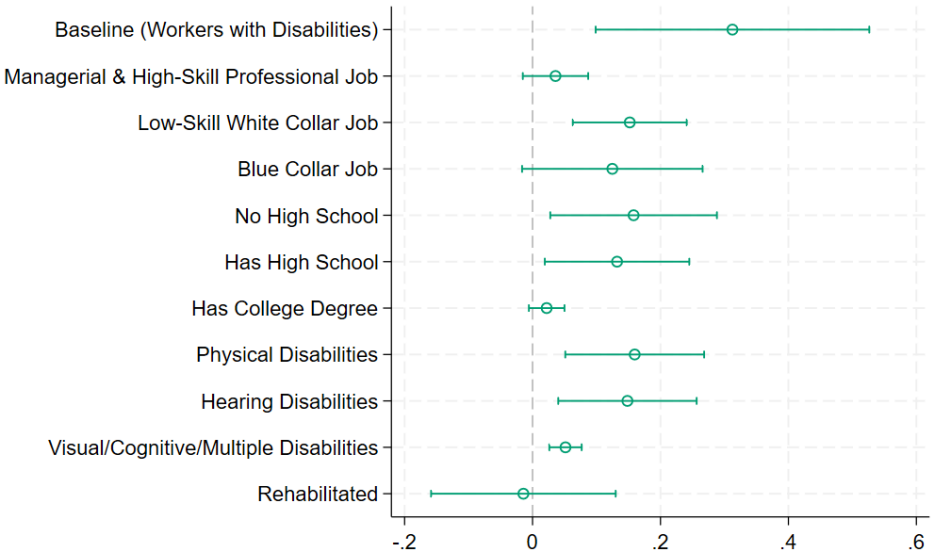
(c) Displaced with Disabilities



(d) Displaced without Disabilities

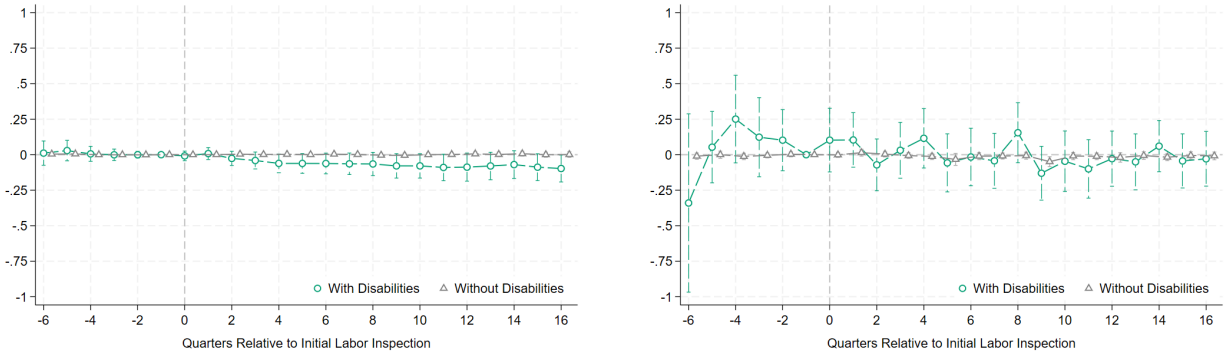
Note: This figure reports point estimates of the quarterly effects of AA quota on hires and separations of workers with and without disabilities. All graphs refer to a Poisson model with year and firm fixed effects and without time-varying firm-level controls. Because the Poisson models do not converge with the inclusion of state- and industry-specific trends, I exclude them from the set of firm-level controls.

Figure E4: Heterogeneous Employment Effects of AA Quotas



Note: This figure reports aggregate point estimates of the aggregate effects of AA quota on employment of people with disabilities considering heterogeneity across jobs, educational levels, and disabilities. The baseline specification refers to Column (1) of Table 3.

Figure E5: Additional Effects of AA Quotas on Wages



(a) Incumbent Workers

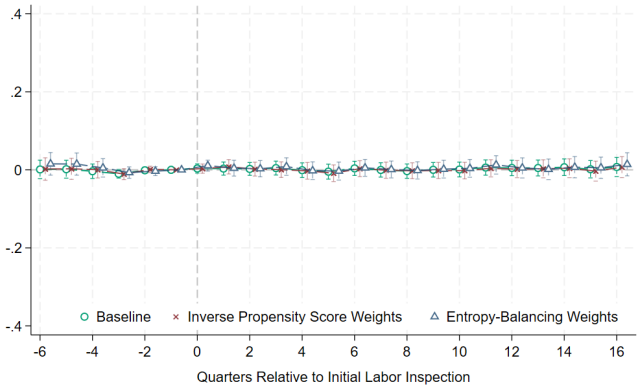
(b) New Hires

Note: These figures report the quarterly effects of AA quota on log hourly wages for incumbent workers (on the left) and new hires (on the right) with and without disabilities. More details can be found in Columns (5) and (6) of Table 4.

Figure E6: Robustness of Selected Worker-Level Effects: Re-Weighting Methods

(a) Log Hourly Wages

(b) Log Number of Contracted Hours



(c) Part-Time Employment

Note: This figure reports point estimates of the quarterly effects of AA quota on log hourly wages, log number of contracted hours, and the likelihood of part-time employment for workers with disabilities using re-weighting methods. The green circle estimates repeat the baseline specification from Figure 4(a). The red x estimates refer to coefficients using inverse propensity score weights from the following pre-inspection characteristics: gender, race, age, squared age, education, and occupation. The blue triangle estimates show coefficients using entropy-balancing weights from Hainmueller (2012) with the same set of characteristics.

F Tables (Firm- and Worker-Level Analyses)

Table F1: Descriptive Statistics of Labor Violations

	(1) Control Firms		(2) Treated Firms		(3) Full Sample	
	Mean	SD	Mean	SD	Mean	SD
Formal Registration	0.41	0.49	0.43	0.50	0.34	0.47
Working Hours	0.19	0.39	0.16	0.36	0.10	0.31
Rest	0.13	0.34	0.12	0.33	0.08	0.28
Wages	0.14	0.35	0.12	0.33	0.13	0.33
Severance Pay	0.21	0.41	0.19	0.39	0.32	0.47
Unemployment Insurance	0.01	0.12	0.01	0.09	0.01	0.11
RAIS	0.04	0.20	0.04	0.19	0.03	0.18
Transportation Subsidy	0.03	0.16	0.03	0.17	0.04	0.19
Other Violations	0.35	0.48	0.35	0.48	0.34	0.47

Note: This table reports descriptive statistics of labor violations. The first two columns refer to a sample of control firms, whereas Columns (3) and (4) report summary statistics for the treatment group. The last two columns correspond to the full sample of labor inspections. Further details on the sample construction are found in Section 5. I compute statistics for violations found during inspections and related to formal registration, working hours, rights to rest, wages, severance pay, unemployment insurance, RAIS, transportation subsidies, and other labor violations. Sources: RAIS and data on inspections.

Table F2: Descriptive Statistics: Firm-Level Sample

	(1)		(2)		(3)		(4)	
	Control Firms				Treated Firms			
	Pre		Post		Pre		Post	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Main Variables								
# Employees without Disabilities	74.87	26.89	97.25	82.19	96.40	37.32	131.83	276.80
# Employees with Disabilities	0.31	3.63	0.47	4.15	0.29	2.56	0.77	4.32
Has at Least One Employee with Disabilities	0.09	0.28	0.14	0.35	0.13	0.33	0.26	0.44
Share Employees with Disabilities (x100)	0.38	4.41	0.43	3.68	0.31	2.74	0.59	3.73
Average Earnings	2,082.03	1,808.96	2,177.57	1,747.74	2,106.26	1,931.22	2,240.17	1,931.58
Log Average Earnings	7.47	0.51	7.52	0.63	7.47	0.53	7.51	0.73
Location								
Central West Region	0.07	0.26	0.07	0.26	0.05	0.22	0.05	0.22
North Region	0.04	0.20	0.04	0.20	0.04	0.20	0.04	0.20
Northeast Region	0.11	0.31	0.11	0.31	0.11	0.31	0.11	0.31
South Region	0.22	0.42	0.22	0.41	0.26	0.44	0.26	0.44
Southeast Region	0.56	0.50	0.56	0.50	0.54	0.50	0.54	0.50
Economic Sector								
Construction	0.07	0.26	0.07	0.26	0.08	0.27	0.08	0.27
Commerce	0.20	0.40	0.19	0.39	0.17	0.37	0.16	0.37
Transp., Storage & Commun.	0.09	0.28	0.09	0.28	0.08	0.28	0.08	0.28
Transformation Industry	0.29	0.45	0.30	0.46	0.28	0.45	0.29	0.45
Real Estate	0.15	0.36	0.15	0.36	0.18	0.38	0.17	0.38
Services	0.04	0.19	0.04	0.19	0.04	0.19	0.04	0.19
Other Categories	0.17	0.37	0.17	0.37	0.18	0.38	0.18	0.38
N	2,077		2,077		1,202		1,202	

Note: This table reports descriptive statistics for firms using information from RAIS data. The first two columns refer to a sample of control firms. Columns (3) and (4) report summary statistics for the treatment group. Further details on the sample construction are found in Section 5. Odd columns indicate summary statistics using the averages before labor inspection while even columns refer to the period following it. The variables are total number of employees without and with disabilities, indicator for having at least one employee with disabilities, share of employees with disabilities, log average earnings, indicator variables for whether the establishment is located in Central-West, North, Northeast, South and Southeast regions, average population of the municipality in which the establishment is located, and indicator variables for economic sector the establishment belongs to (construction, commerce, transportation, storage and communication, transformation industry, real estate, services, or other sectors). Sources: RAIS and data on inspections.

Table F3: Robustness Checks: Firms-Level Results

	(1) employm.	(2) employm. (relabeling)	(3) (IHS) employm.	(4) employm.	(5) employm. (non-disabled)	(6) employm.	(7) employm.	(8) employm.	(9) employm.	(10) employm.
Panel A: Dynamic Impacts										
Immediate ($k = 0$)	-0.035	0.005	0.027***	-0.068	-0.002	-0.032	-0.059	-0.046	0.051	0.046
	(0.080)	(0.020)	(0.010)	(0.195)	(0.008)	(0.080)	(0.095)	(0.113)	(0.049)	(0.064)
Short Run ($k = 6$)	0.413**	0.213**	0.121***	0.499	0.037	0.397**	0.462**	0.408*	0.630***	0.422*
	(0.194)	(0.096)	(0.023)	(0.359)	(0.052)	(0.193)	(0.228)	(0.243)	(0.239)	(0.235)
Long Run ($k = 12$)	0.434***	0.196**	0.162***	0.454	0.045	0.416***	0.473**	0.418*	0.516***	0.422***
	(0.153)	(0.077)	(0.027)	(0.370)	(0.068)	(0.155)	(0.185)	(0.219)	(0.166)	(0.122)
Panel B: Aggregate Impacts										
Post × Treated	0.313***	0.158***	0.132***	0.483**	0.049	0.315***	0.280**	0.274**	0.441***	0.351***
	(0.109)	(0.052)	(0.018)	(0.244)	(0.053)	(0.115)	(0.130)	(0.136)	(0.132)	(0.115)
Sample Size	65580	65580	65580	65580	65580	65580	51240	37420	52160	40100
Firm and Year FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State and Industry Trends	✓	✓	✓	×	×	×	✓	✓	✓	✓
Sample Restriction	75-125 emp.	75-125 emp.	75-125 emp.	75-125 emp.	75-125 emp.	75-125 emp.	80-120 emp.	85-115 emp.	85-115 emp.	85-115 emp.
Model	OLS	OLS	OLS	Poisson	Poisson	OLS	OLS	OLS	OLS	OLS
# Firms	3279	3279	3279	3279	3279	3279	2562	1871	2608	2005
Mean Dep. Var (Control)	0.310	0.111	0.108	0.310	74.867	0.310	0.307	0.337	0.302	0.254

Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports several robustness checks for the firm-level analysis. Column (1) repeats Column (1) from Table 3. Column (2) refers to the relabeling of existing workers with disabilities as the dependent variable. Column (3) refers to the inverse hyperbolic sine transformation of the number of workers with disabilities as the dependent variable. Columns (4) and (5) estimate a conditional fixed-effect Poisson model using the number of employees with and without disabilities as dependent variables (without state- and industry-specific trends). Column (6) excludes state- and industry-specific trends from the set of firm controls. Columns (7) and (8) consider narrower windows around the cutoff. Columns (9) and (10) exclude firms very close to the cutoff. Means of dependent variables are computed from the control group in the quarterly window [-6, -1] before the labor inspection. Standard errors are clustered at the firm level.

Table F4: Descriptive Statistics: Worker-Level Sample

	(1)		(2)		(3)		(4)	
	Control Workers				Treated Workers			
	Before		After		Before		After	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Main Variables								
Has Disability	0.00	0.06	0.01	0.07	0.00	0.05	0.01	0.08
Hourly Earnings	12.68	29.58	14.47	32.26	12.42	24.23	14.12	27.23
Log Hourly Earnings	2.28	0.66	2.38	0.71	2.28	0.66	2.36	0.71
Contracted Hours (Monthly)	185.41	23.82	184.58	24.37	184.74	23.58	183.87	24.68
Male	0.66	0.47	0.66	0.48	0.65	0.48	0.62	0.48
White	0.66	0.47	0.61	0.49	0.68	0.46	0.63	0.48
Has College Degree	0.10	0.30	0.11	0.31	0.10	0.30	0.11	0.32
Manager	0.03	0.18	0.03	0.17	0.03	0.17	0.03	0.17
Professional	0.15	0.35	0.15	0.36	0.15	0.36	0.16	0.37
Low-Skill White Collar	0.16	0.37	0.17	0.38	0.16	0.36	0.17	0.38
Low-Skill Blue Collar	0.66	0.47	0.65	0.48	0.66	0.47	0.63	0.48
Location								
Central West Region	0.07	0.26	0.07	0.26	0.05	0.21	0.05	0.22
North Region	0.04	0.19	0.05	0.21	0.04	0.19	0.04	0.21
Northeast Region	0.10	0.30	0.11	0.31	0.11	0.31	0.11	0.31
South Region	0.22	0.42	0.21	0.40	0.27	0.44	0.23	0.42
Southeast Region	0.56	0.50	0.57	0.50	0.54	0.50	0.56	0.50
Sector								
Construction	0.06	0.24	0.08	0.27	0.07	0.25	0.08	0.27
Commerce	0.19	0.39	0.18	0.38	0.16	0.37	0.15	0.36
Transp., Storage & Commun.	0.08	0.28	0.09	0.28	0.08	0.27	0.08	0.27
Transformation Industry	0.29	0.45	0.29	0.45	0.28	0.45	0.25	0.43
Real Estate	0.15	0.36	0.16	0.37	0.18	0.38	0.23	0.42
Services	0.04	0.21	0.04	0.20	0.04	0.20	0.04	0.20
Other Categories	0.18	0.38	0.16	0.37	0.19	0.39	0.17	0.37
N	845,797				712,334			

Note: This table reports descriptive statistics for workers using information from RAIS data. The first two columns refer to a sample of workers from control firms. Columns (3) and (4) report summary statistics for the treatment workers. Further details on the sample construction are found in Section 5. Odd columns indicate summary statistics using the averages in the quarterly window [-6,-1] before labor inspection while even columns refer to the quarterly window [0, 12] following it. The variables are: an indicator for having a disability, hourly wages, log hourly wages monthly number of hours contracted, indicators for male, white, having a college degree, indicators for the manager, professional, low-skill white collar, and blue-collar positions, indicator variables for whether the establishment is located in Central-West, North, Northeast, South, and Southeast regions, and indicator variables for economic sector the establishment belongs to (construction, commerce, transportation, storage and communication, transformation industry, real estate, services, or other sectors).

G Survey with Firms

G.1 Survey Overview

To understand how people with disabilities are perceived in the labor market in Brazil, I designed and implemented a novel survey in collaboration with Oppen Social. The survey instrument included vignette experiments and questions about affirmative action support, together with questions about challenges and concerns in hiring people with disabilities. The final sample has 60 firms extracted from the RAIS data, with 31 firms having more than 100 employees. Due to inherent differences between very small and larger firms, I exclude firms with less than 50 employees from the initial sampling process. In June of 2022, Oppen Social attempted to contact, within a window of seven days, representatives of Human Resources (HR) departments from 764 and 751 firms found in the RAIS data with less and more than 100 employees in order to conduct a phone interview expected to last about 30 minutes. In cases in which the firm did not have an HR department, the interview was conducted with an employee familiar with the recruiting process at the firm. The response rate was 4 percent. The low response rate aligns with previous surveys conducted by Oppen Social and is expected for a 30-minute phone survey conducted with HR representatives.

Around 52 percent of surveyed firms are located in the Southeast region, 19 percent in the Northeast, 17 percent in the South, 9 percent in the Central West, and 3 percent in the North. About 18 percent of firms belong to the manufacturing sector, 4 percent to transportation, and 16 percent to wholesale or retail. The distribution of firms in terms of industry and location is similar to the national sample (see Table A2 from Szerman (2023)).

G.2 Survey Questions

The survey consists of five complementary parts. The first part of the survey has questions related to affirmative action support. I ask respondents to rate on a four-point scale, in which 1 is "disagree" and 4 is "agree a lot", how much they agree that: (i) "women should have preference in hiring in the labor market"; (ii) "black people should have preference in hiring in the labor market"; (iii) "people with disabilities should have preference in hiring in the labor market"; and (iv) "hiring quotas for people with disabilities should exist". The order of questions and the appearance of one of the last two questions are randomized.

The second part of the survey consists of questions adapted from Alfaro-Urena et al. (2021). I ask respondents to select up to three alternatives about: (i) "which are the most important aspects your company uses to select highly qualified workers (e.g., managers, engineers, and administrators)"; (ii) "which are the most important aspects your company uses to select less qualified workers (e.g. operators, packers, and janitorial staff)"; and (iii) "which are the most important aspects your company uses to select workers with disabilities". The alternatives are: (a) curriculum vitae; (b) letters of recommendation or references from former employers or teachers; (c) immediate availability; (d) test of cognitive, psychometric, or psychological skills; (e) test of knowledge or professional skills related to the job; (f) evaluation during the probationary period; (g) interviews or tests using English or other languages; (h) criminal records; and (j) availability of infrastructure or assistive technologies. The order of questions is also randomized.

The third part of the survey adds a vignette experiment describing a big fictitious consultancy company that would like to hire someone for an entry-level job to do routine clerical and organizational tasks. The vignette introduces Rafael, a 22-year-old man who finished high school, has flexibility, proactivity, and good organizational skills, and interacts well with people. For some respondents, I randomize the information that this man has a bilateral hearing loss. This disability is chosen because it is one of the most prevalent disabilities, and it does not require additional accommodation costs or even interfere with productivity for this position. I ask respondents to rate on a four-point scale, in which 1 is "unlikely" and 4 is "very likely", how likely they think that the company would be interested in hiring him and how likely they think that he would accept the job.

The fourth part of the survey is adapted from Domzal et al. (2008). I include questions about the employer's perspective on the employment of people with disabilities. I ask respondents how likely they agree on a four-point scale, in which 1 is "disagree" and 4 is "agree a lot", that the following issues represent barriers to hire workers with disabilities at the company: (i) lack of knowledge or information about people with disabilities; (ii) accommodations and barriers during the hiring process; (iii) attitudes of co-workers; (iv) attitudes of supervisors; (v) fear of absenteeism; (vi) accommodation costs; (vii) cannot find qualified people with disabilities; and (viii) nature of the work cannot be performed by people with disabilities. In option (vi), I also ask respondents to provide examples of accommodation costs that the company incurred in order to hire a worker with disabilities to verify whether their answers

correspond to reality.

I next describe some concerns about people with disabilities often heard from employers. I ask respondents to rate on a four-point scale, in which 1 is "disagree" and 4 is "agree a lot", how much they agree that each concern is important at the company: (i) supervisors are not comfortable managing people with disabilities; (ii) supervisors are not sure how to evaluate a person with a disability; (iii) co-workers are not comfortable with colleagues with disabilities; (iv) workers with disabilities lack the skills and experience to do their jobs; (v) workers with disabilities might not be as safe and productive as other workers without disabilities; (vi) it costs more to hire a worker with disabilities due to additional management time; and (vii) negative stigma associated with disability hiring quotas for workers with disabilities.

I further outline some strategies that companies use to hire workers with disabilities. I interrogate how much respondents agree on a four-point scale, in which 1 is "disagree" and 4 is "agree a lot", that the following strategies are useful to reduce barriers to hire workers with disabilities: (i) using recruitment agency specialized in people with disabilities; (ii) creating a diversity committee and training existing staff; (iii) increasing availability of assistive technologies; (iv) flexible working hours; (v) fiscal incentives, such as subsidies and tax deductions; and (vi) more labor inspections.

In the fifth part of the survey, I introduce open questions about the performance of the last hire with disabilities relative to the peers at the firm, whether accommodations were provided to this hire with disabilities, and the employer's perceptions about what and who triggered labor inspections to better understand some mechanisms behind worker-level results. These questions are designed to let respondents openly share their perceptions about disability issues at the workplace.

G.3 Survey Results

I discuss the survey results in two ways. First, I report the average means of the responses across control and treatment firms, which correspond to firms without and under AA quota requirements (i.e., firms with fewer and more than 100 employees). Second, I show differences in responses between these two groups, along with standard errors. These differences are robust to the inclusion of type of questionnaire fixed effects to account for the fact that the order of some questions is randomized.

Affirmative Action Support. Panel A of Table G2 displays results for affirmative action support. Relative to black people and women, respondents are, on average, more likely to support preference in hiring for people with disabilities. There are no statistically significant differences across groups of firms. The p-values range from 0.330 to 0.967.

Vignette Experiment. For the vignette experiment, I consider the following specification:

$$R_{ij} = \alpha + \beta_1 \times \mathbf{1}(\text{Quota}_i \geq 100) \times \mathbf{1}(\text{Has Disability}_i = 1) + \beta_2 \times \mathbf{1}(\text{Quota}_i \geq 100) + \beta_3 \times \mathbf{1}(\text{Has Disability}_i = 1) + \gamma_j + \epsilon_{ij}, \tag{14}$$

in which R_{ij} stands for firm i's answer in questionnaire type j; $\mathbf{1}(\text{Quota}_i \geq 100)$ is an indicator for treated firms with at least 100 employees; $1(\text{Has Disability}_i = 1)$ stands for firm i's question receiving randomized information on disability; and γ_j is the questionnaire type fixed effects. Standard errors are clustered at the firm level.

Table G1 reveals results for the vignette experiment. Firms are, on average, 22.2 percent less likely to express interest in hiring a fictitious candidate with disabilities relative to a similar counterpart without disabilities. Firms do not display significant differences in the perceived likelihood that a fictitious candidate will accept the position.

Table G1: Survey: Vignette Experiment

	(1) Hire	(2) Accept
Above 100 emp.	-0.093	0.019
	(0.193)	(0.169)
Has Disability	-0.723**	-0.150
	(0.309)	(0.301)
Has Disability x Above 100 emp.	0.403	0.291
	(0.271)	(0.259)
Mean Dep. Var (Control)	3.258	3.194
Mean Dep. Var (Treated)	3.345	3.345

Note: Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports the means of answers for firms with fewer and more than 100 employees, along with point estimates after estimating Equation (14). The final sample has 60 firms, with 31 firms having more than 100 employees.

Most Important Aspects to Select Workers. Table G2 presents results for the most important aspects of selecting highly skilled, less skilled, and disabled workers. Curriculum Vitae (CV) is the most important factor for these three groups of workers. Some additional patterns emerge. First, the most important factors to hire workers with disabilities resemble the ones to hire less skilled than factors to recruit highly skilled workers. Second, around 34 percent of employers report the availability of infrastructure or assistive technologies as an important factor. However, there are no significant differences across AA quota groups (p-value = 0.528). Third, firms under the AA quota are more likely to use the probationary period (p-value = 0.002) and less likely to use knowledge tests (p-value = 0.111) as factors in selecting workers with disabilities. Fourth, although larger firms are more likely to use CV to select highly (p-value = 0.054) and less skilled workers (p-value = 0.058), such a differential pattern is not evident for people with disabilities (p-value = 0.304).

Employer Perceptions: Challenges, Concerns, and Reducing Barriers in Hiring People with Disabilities. Panel B of Table G3 reveals several challenges in hiring people with disabilities. I find that the most relevant challenges are the following: lack of knowledge or information about people with disabilities, inability to find qualified people with disabilities, and accommodations and barriers during the hiring process. These patterns seem consistent with employers having more challenges in interpreting signals from people with disabilities. As indirect evidence of lower hiring standards to recruit more workers with disabilities (Coate and Loury, 1993), I also find that firms under AA quota are more likely to report that they cannot find qualified workers with disabilities (p-value = 0.072). Rates for attitudes of co-workers and supervisors as challenges are lower. On the other hand, firms under AA quota are more likely to report the attitudes of co-workers (p-value = 000) and supervisors (p-value = 0.012) as challenges.

Panel C turns to concerns about workers with disabilities at the company. Supervisors who are not sure how to evaluate a person with a disability appear as the most relevant concern, followed by supervisors who are not comfortable managing workers with disabilities. Firms under the AA quota are also more likely to report that people with disabilities might not be as safe and productive as other workers without disabilities (p-value = 0.032), workers with disabilities require additional management time (p-value = 0.136), and co-workers are not comfortable with colleagues with disabilities (p-value = 0.039). These results are

consistent with evidence that workers with disabilities have lower educational levels.

Lastly, Panel D illustrates the most relevant strategies to reduce barriers to hiring people with disabilities. Respondents tend to disagree that more frequent labor inspections and flexible working hours would represent important strategies. Interestingly, there is no evidence that firms under the AA quota are more likely to report investments in screening capital (e.g., specialized recruitment agencies) and workplace accommodations (e.g., increasing availability of assistive technologies) as relevant strategies. If anything, firms under the AA quota are *less* likely to agree that specialized recruitment agencies as relevant strategies (p-value = 0.050).

Open Questions. Among other questions, the survey asks how likely respondents think on a four-point scale, in which 1 is "disagree" and 4 is "agree a lot", that inspections are triggered by employees. I find that 41.67 percent of respondents report to be likely or very likely. When asked who they think made these complaints, employees with disabilities are never mentioned.

Table G2: Survey Responses: Affirmative Action Support and Employer Perceptions

	(1) Mean (Control)	(2) Mean (Treated)	(3) Diff. (1)-(2)	(4) (Std. Err.)	(5) P-Value
Panel A: Affirmative Action Support					
Women should be given preference in hiring	2.323	2.333	-0.011	(0.260)	0.967
Blacks should be given preference in hiring	2.194	2.231	-0.037	(0.252)	0.883
PwD should be given preference in hiring	3.062	2.714	0.348	(0.351)	0.330
Hiring quotas for PwD should exist	3.333	3.467	-0.133	(0.230)	0.566
Panel B: Challenges in Hiring People with Disabilities					
Lack of knowledge or information about people with disabilities	2.586	2.464	0.122	(0.258)	0.638
Accommodations or barriers during the hiring process	2.161	2.414	-0.253	(0.257)	0.329
Attitudes of co-workers	1.367	2.172	-0.806***	(0.210)	0.000
Attitudes of supervisors	1.400	2.000	-0.600**	(0.232)	0.012
Fear of absenteeism	1.452	1.759	-0.307	(0.201)	0.131
Not knowing how much accommodation will cost	1.613	1.621	-0.008	(0.215)	0.971
Cannot find qualified PwD	2.226	2.690	-0.464*	(0.253)	0.072
Nature of the work cannot be performed by PwD	1.677	1.759	-0.081	(0.225)	0.720
Panel C: Concerns for the Company					
Supervisors are not comfortable managing PwD	1.700	2.000	-0.300	(0.224)	0.186
Supervisors are not sure how to evaluate a PwD	2.034	2.034	0.000	(0.253)	1.000
Co-workers are not comfortable with colleagues with disabilities	1.333	1.759	-0.425**	(0.201)	0.039
PwD lack the skills and experience to do their jobs	1.355	1.552	-0.197	(0.204)	0.339
PwD may not be as safe and productive as other workers	1.484	2.000	-0.516**	(0.234)	0.032
It costs more due to additional management time	1.567	1.897	-0.330	(0.218)	0.136
Negative stigma associated with hiring quota for PwD	1.742	1.759	-0.017	(0.228)	0.942
Panel D: Strategies to Reduce Barriers in Hiring People with Disabilities					
Specialized recruitment agencies	3.065	2.621	0.444**	(0.222)	0.050
Diversity committee and training existing staff	2.839	2.828	0.011	(0.204)	0.957
Increasing availability of assistive technologies	2.839	2.750	0.089	(0.187)	0.638
Flexible working hours	2.323	2.586	-0.264	(0.235)	0.266
Fiscal incentives, such as subsidies and tax deductions	2.677	2.793	-0.116	(0.244)	0.637
More labor inspections	2.323	2.276	0.047	(0.255)	0.855

Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports the means of answers for firms with fewer and more than 100 employees, along with differences in means, standard errors, and p-values. The final sample has 60 firms, with 31 firms having more than 100 employees.

Table G3: Survey Responses: Affirmative Action Support and Employer Perceptions

	(1) Mean (Control)	(2) Mean (Treated)	(3) Diff. (1)-(2)	(4) (Std. Err.)	(5) P-Value
Panel A: Three Most Important Factors to Select People With Disabilities					
Curriculum Vitae	0.633	0.759	-0.125	(0.121)	0.304
Letters of recommendations or references from former employers/teachers	0.333	0.207	0.126	(0.117)	0.283
Immediate availability	0.100	0.207	-0.107	(0.094)	0.261
Test of cognitive, psychometric, or psychological skills	0.167	0.103	0.063	(0.090)	0.487
Test of knowledge or professional skills related to the job	0.400	0.207	0.193	(0.119)	0.111
Evaluation during the probationary period	0.367	0.759	-0.392***	(0.121)	0.002
Interview or test using English or other languages	0.167	0.172	-0.006	(0.099)	0.954
(Lack of) Criminal records	0.100	0.069	0.031	(0.074)	0.675
Availability of infrastructure or assistive technologies	0.300	0.379	-0.079	(0.125)	0.528
Panel B: Three Most Important Factors to Select Less Skilled Workers					
Curriculum Vitae	0.742	0.929	-0.187*	(0.096)	0.058
Letters of recommendations or references from former employers/teachers	0.484	0.250	0.234*	(0.124)	0.065
Immediate availability	0.387	0.321	0.066	(0.127)	0.606
Test of cognitive, psychometric, or psychological skills	0.161	0.143	0.018	(0.095)	0.847
Test of knowledge or professional skills related to the job	0.226	0.214	0.012	(0.110)	0.917
Evaluation during the probationary period	0.387	0.571	-0.184	(0.130)	0.162
Interview or test using English or other languages	0.161	0.179	-0.017	(0.099)	0.863
(Lack of) Criminal records	0.097	0.143	-0.046	(0.086)	0.592
Panel C: Three Most Important Factors to Select Highly Skilled Workers					
Curriculum Vitae	0.645	0.862	-0.217*	(0.110)	0.054
Letters of recommendations or references from former employers/teachers	0.419	0.552	-0.132	(0.130)	0.313
Immediate availability	0.129	0.172	-0.043	(0.094)	0.645
Test of cognitive, psychometric, or psychological skills	0.323	0.379	-0.057	(0.125)	0.652
Test of knowledge or professional skills related to the job	0.484	0.448	0.036	(0.131)	0.787
Evaluation during the probationary period	0.484	0.276	0.208	(0.125)	0.101
Interview or test using English or other languages	0.161	0.207	-0.046	(0.101)	0.655
(Lack of) Criminal records	0.129	0.069	0.060	(0.078)	0.447

Note: ***: significant at 1% level; **: significant at 5% level; *: significant at 10% level. This table reports the means of answers for firms with fewer and more than 100 employees, along with differences in means, standard errors, and p-values. The final sample has 60 firms, with 31 firms having more than 100 employees.

H Welfare Implications of Enforcement of AA Quotas

H.1 Model Derivations and Implications

Decision Trees. Figures H1 and H2 illustrate firm and individual choices.

Figure H1: Decision Tree with Firm Payoffs

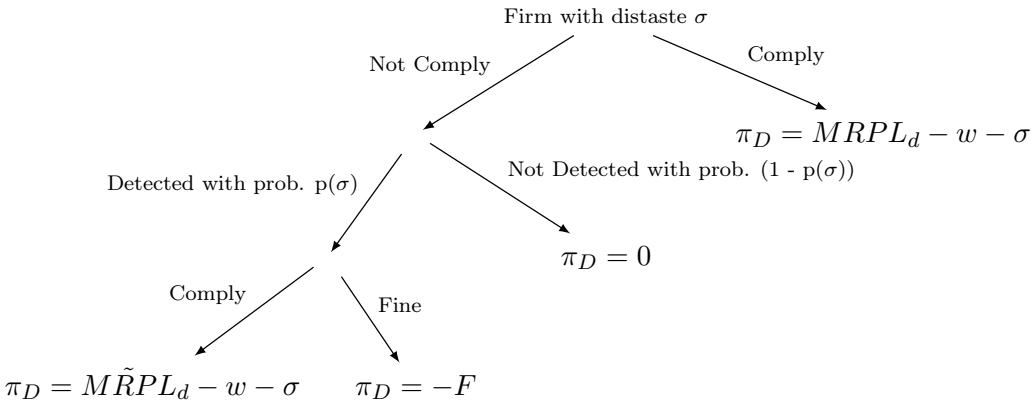
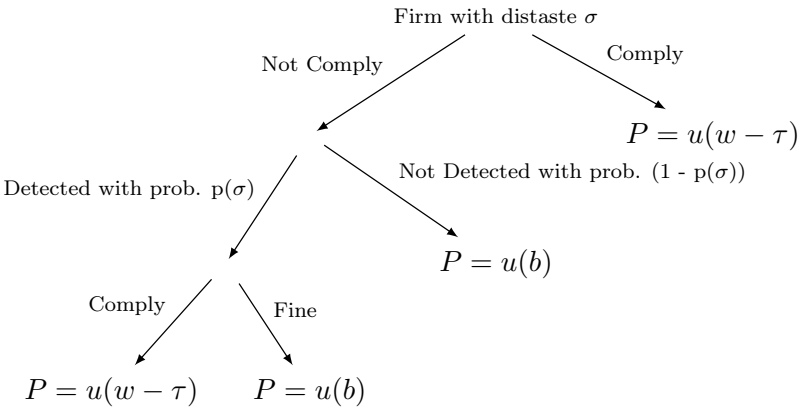


Figure H2: Decision Tree with Individual Payoffs



Enforcement and Welfare. An increase in the probability of detection $p(\sigma^*)$ impacts the expected payoff associated with non-compliance, thereby affecting the expected utility of inframarginal firms. The welfare impacts of a small change in enforcement can be expressed as:

$$\frac{\partial V}{\partial \sigma^*} = M_C[u(w - \tau) - v(b)], \tag{15}$$

in which $M_C \equiv \int_{\sigma^c}^{\sigma^F} \frac{\partial p(\sigma^*)}{\partial \sigma^*} f(\sigma)\, d(\sigma)$ represents the mass of inframarginal firms who choose compliance instead of delinquency due to a small change in enforcement.[40] We note that the welfare impacts summarize the changes in the individual surplus of people with disabilities from the increase in the number of individuals being employed in the formal sector instead of receiving welfare benefits due to non-employment.

Analogously, the impacts on firm profits can be written as follows:

$$\frac{\partial \Pi}{\partial \sigma^*} = (M\tilde{R}PL_d - w)M_C - M_F F, \tag{16}$$

in which $M_F \equiv \int_{\sigma^F}^{1} \frac{\partial p(\sigma^*)}{\partial \sigma^*} f(\sigma)\, d(\sigma)$ is the mass of firms that get fined. The impacts on producer surplus incorporate the changes in surplus weighted by the amount of fines paid ($M_F F$) and the difference between the marginal revenue product and wages paid to the new hires with disabilities $(M\tilde{R}PL_d - w)M_C$.

Finally, the effects on revenues can be expressed in the following way:

$$\frac{\partial R}{\partial \sigma^*} = M_C[\tau + b] + M_F F, \tag{17}$$

in which the marginal revenue benefit is the revenue raised from higher employment ($M_C[\tau - b]$) and fines ($M_F F$).

Optimal Enforcement Policy. The government sets enforcement level σ^* that maximizes the following social welfare function:

$$W(\sigma^*) = V(\sigma^*) + \Pi(\sigma^*) - C(\sigma^*). \tag{18}$$

Under standard regularity conditions, the first-order condition can be written as:

[40] The policy has no welfare change for firms that always abstain from compliance regardless of enforcement level. In addition, due to the envelope theorem, the policy also has no welfare change from firms that always comply with the regulation regardless of enforcement level.

$$\underbrace{V'(\sigma^*)}_{\text{marginal welfare benefit}} = \underbrace{C'(\sigma^*)}_{\text{marginal cost of enforcement}} - \underbrace{\Pi(\sigma^*),}_{\text{marginal producer loss}} \tag{19}$$

in which the government chooses enforcement level to set its marginal benefit equal to marginal cost. Put differently, the government trades off the overall marginal private benefits of higher employment of people with disabilities against the marginal cost of conducting inspections and the marginal lost surplus to firms. Because the empirical results indicate that people without disabilities are unaffected, there is no welfare change for them.

If the government also uses a higher enforcement level to raise additional fiscal revenues $R(\sigma^*)$ (e.g., to increase the provision of public goods), the first-order condition can alternatively be written as:

$$\underbrace{V'(\sigma^*)}_{\text{marginal welfare benefit}} + \underbrace{R'(\sigma^*)}_{\text{marginal revenue benefit}} = \underbrace{C'(\sigma^*)}_{\text{marginal cost of enforcement}} - \underbrace{\Pi'(\sigma^*),}_{\text{marginal producer cost}} \tag{20}$$

in which the marginal revenue benefit enters in the left-hand side and indicates that the government is willing to tolerate larger welfare loss to firms. If the marginal costs exceed the extra revenues raised, the government must weigh the deadweight loss against the marginal benefits of increasing the enforcement level.

Plugging Equations (15), (16), and (17) into Equation (20), we have that:

$$\underbrace{M_C[u(w-\tau)-v(b)]}_{\text{marginal welfare benefit}} + \underbrace{M_C[\tau+b]}_{\text{marginal revenue benefit}} = \underbrace{C'(\sigma^*)}_{\text{marginal cost of enforcement}} + \underbrace{M_C(w-M\tilde{R}PL_d)}_{\text{marginal producer cost}}. \tag{21}$$

All objects can be obtained from the data and the reduced-form estimates. The first term — the marginal welfare benefit — depends on the job surplus. The marginal revenue benefit can be directly obtained from the Census data. The marginal cost of enforcement can be bounded by the average cost of inspections. The marginal producer loss can be computed even without data on firm outcomes through a simple discrete choice framework, which I discuss in detail in Section 6.2. I also propose an alternative approach to recover a "break

even" producer loss.

Incumbent Workers with Disabilities. Thus far, the model does not distinguish between new hires and incumbent workers with disabilities and assumes fixed wages. If firms adjust through lower wage growth to incumbent workers with disabilities, such adjustment represents a transfer from people with disabilities and the government to firms under linear functional forms. This implies that the government only needs to trade off marginal benefits and marginal producer loss from new hires with disabilities when evaluating total welfare. Similarly, revenues from fines represent a transfer from firms to the government in linear functional forms.

Marginal Welfare Benefit. To overcome the lack of data on consumption and assets and to get a tractable expression, I assume hand-to-mouth agents so that consumption tracks net income. This assumption is reasonable in this context. I also consider the flow of income, implying that my estimates are very conservative and reflect the lower bound of the benefit side. I take two approaches to derive bounds on the marginal welfare benefit. First, to get an upper bound to the cost of employment, I assume that unemployed individuals do not have marginal disutility from working. In this case, I can approximate the marginal benefit as an extensive margin choice of employment and, therefore, an income flow of a switch from welfare benefits to employment. From the 2010 Census, I calculate that, on average, a worker with disabilities in the formal sector makes 22,660 Brazilian *reais* every year and, as a result, is subject to an income tax rate of 7.5 percent. Each person with disabilities not employed in the formal sector receives 3,827.16 Brazilian *reais* in welfare benefits. Given the 50 percent increase in the number of employees, together with the baseline average of 0.29, the marginal welfare benefit associated with additional hires is 2,484.33 Brazilian *reais*.

Second, to get a lower bound to the cost of employment, I need a parameter representing the utility cost of switching from employment to welfare benefits, which directly depends on the opportunity cost of a full-time job due to lost leisure. In this case, I follow Mas and Pallais (2019) and assume that the value of non-work time relative to labor earnings is 0.58. The estimated marginal welfare benefit is 721.56 Brazilian *reais*.

Marginal Cost of Enforcement. Because there is no data available on inspection-specific spending, I consider the average cost of inspections as an upper bound for the marginal cost

of inspections. According to the Federal Budget Panel (*Painel do Orçamento Federal*), the average annual budget of labor inspected (deflated to 2018 prices) is 27,787,724 Brazilian *reais*. Considering that the total number of inspections per year is about 279,857, each inspection costs around 99.29 Brazilian *reais*. Other enforcement policies that can boost compliance with regulation and target non-compliant firms more directly, such as data-driven inspections and threat-of-audit letters, are possible alternative instruments for the government. While these targeted policies are likely to reduce the costs of inspections in the long term, implementing them would also be costly.

Marginal Revenue Benefit. The marginal fiscal gain is the sum of revenues raised with income tax and saved with welfare benefits from new hires. The marginal revenue benefit is 801.37 Brazilian *reais*.

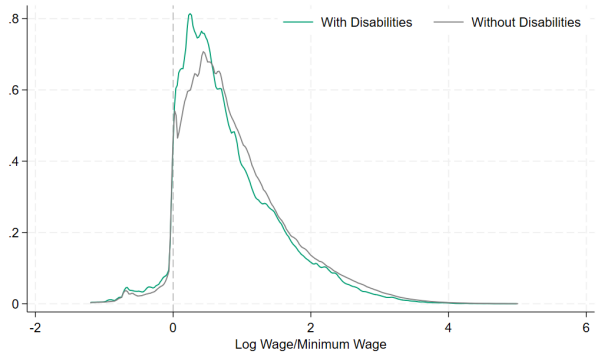
Marginal Producer Cost. Due to the lack of data on profits, changes in producer surplus cannot be directly inferred. Instead, I rely on two indirect approaches to construct bounds for the marginal producer loss. First, I propose a discrete choice framework based on the decision to comply with the AA quotas, which is discussed in detail in Section 6.2. Second, I use reduced-form estimates to back out a "break even" producer cost that sets marginal welfare benefits equal to marginal costs from Equations (19) and (21). Table H1 reports the "break even" values of the average ratio between marginal revenue product of labor and average wages considering different scenarios. Each row indicates whether the opportunity cost of work and fiscal revenue benefit enter into the calculation. Even in the most conservative scenario, the ratio is below one, pointing out that the social benefits exceed the social costs.

Table H1: Cost-Benefit Analysis

(1) Opport. Cost of Work	(2) Revenue Benefit	(3) Break-Even MRPL/w
No	Yes	0.0302
Yes	Yes	0.5667
No	No	0.2741
Yes	No	0.8106

Note: This table reports a range for "break-even" values of $M\tilde{R}PL$, normalized by average wages, that set marginal welfare benefits equal to marginal costs of increasing enforcement of AA quota from Equation (12).

Figure H3: Monthly Wage Distribution among Workers in the Private Sector



Note: Graph illustrates kernel densities (Epanechnikov kernel) of the log wage-to-minimum wage ratio for people without and with disabilities separately. The sample is restricted to workers in firms with at least 100 employees. Source: 2010 RAIS data.