# A literature review on the effectiveness of employer targeted disability employment policies

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# 1. Introduction

This report contributes with a review of the international empirical evaluation literature on the effectiveness of policies that makes it more beneficial for employers to hire disabled individuals.

The goal of disability policies are to provide income security and to integrate the individual into social and economic life. In addition, policies that remove barriers to participation that plague disabled individuals will not only improve their lives but also improve society as a whole by increasing productivity, lowering unemployment, and reducing reliance on government transfers.

During the last couple of decades, there has been a shift in disability policy from inactive to active programs. The tendency has changed perspective from work disability towards work ability. The new focus in disability policies is on what people can do and then provide targeted support. This has implications for integration into the labor market with increased focus on the possibilities of employment policies targeted disable individuals and their potential employers (Greve, 2009).

Policies such as reduced benefit levels and strengthened eligibility criteria aimed at generating labor market participation of people with disabilities often downgrade the safety net. This implies that individuals who are not successful at achieving a certain level of integration can suffer. It is however also the case that guaranteed benefits can serve as a disincentive to participate in the labor market. In this sense the tradeoff of incurrence versus incentives are similar when designing disability policies as when designing unemployment policies. The challenge is to provide support and incentives that facilitate participation in the labor market, while ensuring the means to live a decent life regardless of any disability (Mont, 2004). However, the case is that disabled individuals will face an additional challenge as the potential employers might have concerns of the productiveness of the disabled individuals.

The policies described in this report focuses on reducing these disincentives of the employers. Successful policies targeted employers of disabled individuals have the advantage that they can increase the participation in the labor market of disabled individuals without downgrading the safety net.

A clear complication when designing disability policy is that the population of disabled individuals is highly heterogeneous in terms of their work limitations. Most often disability policies are meant to serve individuals with quite different impairments, including physical and mental disabilities as well as

individuals with chronical cognitive disabilities. Some disabilities are congenital, while others occur later in life potentially in the labor market due to injuries or illnesses.

There is no clear consensus on the most appropriate conceptualization of disability (McVicar et al., 2016). The most widely used is the World Health Organization's International Classification of Disability, Health, and Functioning. The World Health Organization covers some of this complexity of disability by representing it as "an umbrella term for impairments, activity limitations and participation restrictions. It denotes the negative aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and personal factors)"[1]. Börsch-Supan, 2007 shows that cross-country differences in the enrollment-rates into disability insurance cannot be explained by demographic or health-related factors, but are attributable to institutional differences in the disability schemes.

This cross-country variation poses a challenge for this report as a comparison of the effectiveness of disability policies across countries will be affected by the variation in the populations they serve. This is indeed a general challenge to the literature. In this report, I do not attempt to solve this limitation, but the reader is advised to keep the cross-country institutional differences in mind when reading the following. The operational definition of disability applied in this report is that a person is defined as being disabled if he/she is eligible to disability benefits in the country of residence.[2] Thus, policies reviewed in this report are policies, which target individuals eligible for disability benefits.

There are three types of policies aimed at getting disabled individuals to participate in the labor market. The first type of policies focus on the development of human capital. The argument behind these policies is that disabled individuals lack the skill needed to participate in the labor market. If the policies are successful in improving the skills of the disabled individuals then they will be able to compete in the labor market. These policies include vocational rehabilitation, training and sheltered employment.

The second type of policies are put in place in order to deal with the moral hazard problem of the disabled individual. These include adjustments of the benefit level, financial incentive to work programs (such as tax credits for disabled individuals), and adjustments of the eligibility criteria. Adjustment policies of the

[1] http://www.who.int/topics/disabilities/en/

[2] Alternative definitions can be based on self-reporting or purely medical assessments.

benefit level or financial incentive to work attempt to increase the monetary return to taking a job. Policies that strengthen the eligibility criteria can be used as a screening devise, and consecutive eligibility assessments can sure as an implicit utility taxation.

This report concerns the third type of policies. These policies target the potential employers and workplaces. The aim of these policies is to make employers take on the social responsibility of hiring disabled workers. Employers might be incline to hire disabled workers due to the uncertainty of the risks involved, the productivity of the disabled individual, and the potential additional cost in terms of workplace accommodations. These challenges can be targeted by incentivizing or forcing the employers to take on disabled worker. Employers can be incentivized by policies such as wage subsidies and supported employment practices or forced to take on the social responsibility through policies such as quota system, experience rated benefit payment, and targeted anti-discrimination laws.

In this report, I review the evidence of the effectiveness of each of these five types of policies, which target the employers. I only report on policies evaluated using quantitative methods. A general concern for the lessons than can be drawn from this review is the limited number of studies which evaluated employer targeted polices for disabled individuals. This implies that one should be cautious in arguing for external validity of the results. This concern is emphasized by the fact that many of these studies find contradicting results.

## 2. Quotas

A quota is an obligation to employ a specific number or proportion of persons of a particular group. The argument is that a certain share of jobs has to be reserved in a quota systems as disabled workers are unable to compete for a job in the open labor market (Funch, 2014). Employment quotas is traditionally examined within the concept of affirmative action. An affirmative action can broadly be defined as a policy, which provide access to education, health care, employment, or social welfare for individuals of a minority group who have been discriminated against, with the aim of creating a more egalitarian society

(Sargeant et al., 2016). A Quota system is thus a policy, which target structural and/or institutional discrimination[3].

There is a substantial literature seeking to identify discrimination in hiring disabled workers. Bellemare et al., 2018 evaluate a field experiment conducted in Canada, where applications were randomly send out to 1477 private firms. They find that the callback rate for disabled (wheelchair users) and non-disabled applicants was 14.4 percent and 31 percent, respectively. They find that accessibility constraints at the workplace for disabled workers have no explanatory power, and they find that mentioning eligibility to government subsidies to cover costs of workplace adaptions and assistive technologies does not matter for the callback rates. Ravaud et al., 1992 also find the result that wheelchair users are discriminated against in France, and Ameri et al., 2018 find that applicants with Asperger's syndrome or spinal cord injuries are discriminated against in the US. Baert, 2016 finds that applications disclosing disabilities such as blindness, deafness, or autism received a 47% lower response rate than did applications that did not indicate a disability.

The implicit assumption underlying the implementation of a quota system is that employers will turn away disabled workers without quotas. This can be due to discrimination, the unwillingness to bear the costs needed to accommodate disabled workers, a perception that they are not as productive as non-disabled workers, and uncertainty about potential additional costs (Mont, 2004).

Gundersen, 2008 identifies three basic models for disability employment quotas in Europe: 1) Legislative recommendations, 2) Legislative obligations, without effective sanctions, and 3) Legislative obligation backed by sanctions. But even in countries where the quotas are legal obligations there is evidence of an absence of practical enforcement (Greve, 2009). Gundersen, 2008 argues that sanctions are important in determining if quota-systems will work as intended. Based on economic theory, it is to be expect that an increase in the level of penalty/ subsidy or a strengthening of the employer eligibility criteria will incentivize employers to hire and retain more workers with disabilities in the workplace. This is the case as the marginal benefit of hiring and retaining a disabled worker increases after the introduction of a quota system.

[3] Employment quotas for those with a disability originated with hiring veterans after the First World War when employers were encouraged, and in some cases obliged, to employ a specific percentage of disabled war veterans (Thornton, 1998, Sargeant et al., 2016).

The definition of a disabled worker who counts towards the quota can be broad or narrow. It is usually the case, that all employers are subject to the law and to work towards the same national target. Sometimes different quotas are set based on industrial sector, gender, or firm size. Particular groups of individuals, such as individuals with severe impairments, will in some cases be double- or even triple-counted. Some types of occupations may be considered unsuitable for disabled individuals. E.g. construction, mining, or working on board ship. Most often employers who do not meet their target can be penalized for breaking the law (Thornton, 1998).

Levy systems are a specific type of quota schemes in which employers are allowed to make a financial contribution (a levy), to a particular fund instead of meeting the target disability employment quota. This kind of contribution may be a legitimate choice, or permitted only in special cases where the possibilities of direct employment is exhausted. In some countries, the legislation do not allow the employer to pay off the obligation to employ disabled people by paying the levy. E.g. Germany and Japan. Here the levy works not as an alternative to the quota, but as a compliment. In France, the levy contribution should only be paid, when it is assessed that the all other possibilities of complying with the legal obligation cannot be met (Thornton, 1998).

Employment levy-quota systems (and quota systems in general) are easy to finance for governments, as they are relatively low priced programs. The employment of disabled individuals are supported either by the quotas or by employment programs financed by the penalty fees.

In most countries (e.g. Poland, Austria, Germany and France) the financial levies derived from employers not fulfilling quotas are invested in an employment fund with the aim of increasing employment for disabled people. The funds are used on employees with disabilities, providers of special activities, and employers with disabled employees.

In many Western European countries and in Japan, the levy funds are often used to invest in a variety of measures that are deemed to improve the employability of disabled workers. This can be in terms of skill development, but also in terms of removing any disadvantage that the employer may have, when hiring or retaining a disabled employee. In Eastern European countries, the levy funds are mainly used to make financial incentive for employers to hire disabled workers (Thornton, 1998).

The majority of European countries maintain some form of disability employment quota system. These include: Austria, Belgium, Bulgaria, Cyprus, The Czech Republic, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxemburg, Malta, Poland, Portugal, Romania, Slovakia, Slovenia and Spain. There is no effective quota system in Denmark, Estonia, Finland, Iceland, Latvia, The Netherlands, Norway, Sweden or the United Kingdom (Greve, 2009, Funch, 2014).[4]

The criteria for employers to be obliged to employ quotas vary across countries. These criteria are usually based on the size of the company, but can also be industry specific. The number of disabled workers to be employed varies between countries. The quotas typically ranges between 2% and 7% of the regular workforce. Quotas are normally only imposed for firms above a certain threshold. Most often the threshold is based on the number of employees and ranges between 15 and 50 employees (Funch, 2014). In some countries employers are granted the opportunity for trading quota places. In Germany and France it is possible to conclude sub-contracts with organizations with a significant share of employees with disabilities. Employers in the Czech Republic can reduce the minimum number of disabled workers to be employed, or the levy to be paid, by buying products from companies with more than 50% disabled employees (Greve, 2009).

The quota systems are, unfortunately not always filled. In Austria, it was estimated that only 30% of companies complied with the quota norm of 4% in 2002, and in Spain only 14% of business larger than 50 workers were meeting the requirements in 2008 (Zelderloo and Reynaert, 2007 and Greve, 2009). Mont, 2004 argues that Quotas are typically only filled in 50%-75% of the cases and that fines are not always imposed. Sanctioning varies across counties, ranging from very little sanctions in Spain, over small sanctions in most countries (additional payroll tax of approximately 0.5% in e.g Germany) to relatively high sanctions (1 to 4% of the payroll in e.g. France, Italy, and Poland). In some countries, there is also a bonus for employers who employ more than the required number of disabled persons (e.g. Czech Republic and Poland) (Funch, 2014). Funch, 2014 argues that the lack of sanctions or enforcement instruments represents a problem of quota systems.

According to company polls, the costs related to fees are not central for the decision on whether to hire a disabled worker (Funch, 2014, Diery et al., 1997, Fietz et al., 2011). According to these polls the costs

[4] The United Kingdom abolished their quota system in the beginning of the 1990s and, thus, represent a special case.

due to modification measures, working place adaptations and other special arrangements are by far more significant. Sargeant et al., 2016 suggest that some employers may prefer simply to pay a fine instead of employing persons with disabilities. Stull, 2014 show that some employers may attempt to fulfil their quota obligations by paying minimum wages to disabled workers to stay at home, maintain peripheral work, or are segregated into low-level work with minimal responsibility. Brennan and Conroy, 2009 and Eichhorst et al., 2010 show that quota jobs tend to comprise low-qualified activities.

Mont, 2004 raises the prevalent concern in the literature that quotas may result in a cap on the employment of disable workers. It was however not possible to find evidence in support (or against) of this claim.

## 2.1 The effectiveness of quota systems targeted disabled individuals

Even though employment quotas is one of the most commonly applied policies for disabled individuals its effectiveness is not clearly established in the literature. A very limited amount of convincing evaluations is available. Lalive et al., 2013 evaluate the quota system in Austria using a convincing strategy and Mori and Sakamoto, 2018 apply a similar strategy to evaluate the Japanese quota system. Malo and Pagan, 2013, Verick, 2004, Barnay et al., 2016 and Nazarov et al., 2015 study the quota systems in Spain, Germany, France, and South Korean. However, the empirical strategies applied in these papers are not as convincing. The evidence from Lalive et al., 2013 and Mori and Sakamoto, 2018 suggest that levy-quota systems can be effective in promoting employment of disabled workers. I will describe the result from Lalive et al., 2013 and Mori and Sakamoto, 2018 in detail below.

Verick, 2004 and Nazarov et al., 2015 study structural changes in quota systems while Malo and Pagan, 2013 and Barnay et al., 2016 evaluate the quota systems in place. Verick, 2004 evaluated the 2001 disability employment reform in Germany that decreased the quota rate by 1 percentage point (from 6 percent to 5 percent) and increased the minimum employer size covered by the law from 16 to 20 regular workers. The German quota system did not include a levy element, where employers could pay into a

fund in order to avoid the quota. The study found that the changes in the quota system in Germany had no impact on the employment rate of individuals with severe disabilities.[5]

Nazarov et al., 2015 evaluated reforms of the disability employment quota system in 2004 and 2006 in South Korea. In 2004, the minimum size of employers who were covered by the quota system changed from 300 to 50 regular employees, and bonuses to employers who employed above the required level of disabled workers increased substantially. In 2006, the number of vacancies in the public sector for disabled workers was substantially increased, and the penalty for not complying with the quotas was substantially increased. In addition, the number of industries, which were covered by the quota system were expanded. The results in Nazarov et al., 2015 suggest that the changes in the quota system may have increased labor force participation but have had a limited positive impact on the probability of employment among disabled individuals in South Korea.

Malo and Pagan, 2013 evaluate the impact of a Spanish quota system of workers with disabilities in place during the period from 2001 to 2006. At that point in time the mandatory quota was at 2 percent for firms with 50 or more regular workers. As in the German quota system studied in Verick, 2004 the Spanish quota system did not include a levy element, where employers could pay into a fund in order to avoid the quota. Malo and Pagan have administrative data available and they use it to apply a sharp regression discontinuity design to estimate the effect on employment of disabled workers at the threshold. The evaluation shows that strictly beyond the threshold of 50 workers there is an increase in the percentage of workers with disabilities in the firm, just fulfilling the quota of 2 percent.

Barnay et al., 2016 compare the labor trajectories of disabled workers before and after the implementation of the law, which set up a quota of disabled workers in more than 20 employees companies (1968-1986 vs 1988-2006). They use data from a survey conducted in France in 2006-2007. They apply a triple difference approach combined with dynamic exact matching and weighting methods in order to evaluate the effect of the quota system. The result indicate a negative impact of the quota system on the employment of disabled individuals.

[5] Wagner et al., 2001 study the effect of demand shocks, and find no evidence that the German quota system affects job dynamic in establishments around the thresholds.

## Evaluation of the Austria quota system

Lalive et al., 2013 evaluate the quota system in place in Austria during the period 1996 to 2003. They only consider the private sector. The Austrian system can be characterized as a levy-quota system, where the revenues are used to reduce the costs of hiring disabled workers. Prior to 1999, the system also included a bonus for hiring more disabled workers than what is required by the quota (a so-called levy-grant-quota system). The Austrian Disabled Persons Employment Act defines specific employment targets, coupled with financial incentives for meeting these targets. During the period, Austrian firms had to hire at least one disabled workers per 25 nondisabled employees leading to quota thresholds at firm size 25, 50, etc. Disabled workers had to be hired under the same type of contracts offered to nondisabled workers. Firms that failed to comply are subject to a tax (appx. 8% of worker's average monthly salary). The authorities monitor firms' employment obligation every month. Enforcement of noncompliance is in Lalive et al., 2013 reported to be close to 100%.

The tax revenues are used to subsidize firms that provide employment to disabled workers. The Disabled Persons Employment Act defines how noncompliance tax revenues are to be spent. Firms employing disabled workers can get resources for wage subsidies, work assistance, and workplace accommodation. The resources are available to all firms, including small firms not subject to the quota rule. Disabled workers are eligible for payment for vocational training, work assistance, mobility enhancing measures, professional development, and formation of a subsistence securing self-employment.

The empirical strategy in Lalive et al., 2013 exploits the discontinuous change in the relative cost of employing disabled and nondisabled workers around the quota thresholds. The basic idea behind this strategy is that when there is a sharp change in the financial incentives at the quota thresholds then this should affect firms' demand for disabled workers. This empirical strategy closely resembles a regression discontinuity design in the sense that both methods compare the number of disabled workers in firms just below and just above the quota threshold and the density of the firms' size distribution just below and just above the threshold.

Lalive et al., 2013 documents several interesting results. The main result of the paper is that firms facing the obligation to employ disabled workers do employ more disabled workers than similar firms without this obligation. A comparison of firms just above the quota threshold to those just below the threshold

shows that approx. 4 out of 100 firms around the threshold of 25 nondisabled workers have a disabled worker employed, that they would not have hired in the absence of the employment quota[6].

They find that roughly 64% of the employment effect can be attributed to workers already employed by the firm on the date of acquiring formal disability status. 34% of excess employment can be attributed to workers who were employed by other firms at the time of acquiring disability status. The remaining 2% of excess employment are individuals who were not employed at the time of acquiring disability status.

They further evaluate two reforms of the quota system. A bonus to over-complying firms available prior to 1999, and a sharp increase in the noncompliance tax in 2001. The results indicate that the increase in the noncompliance tax increased excess disabled employment, but the bonus to over-complying firms slightly dampens the employment effects of the noncompliance tax. Wuellrich (2010) also finds that increasing the noncompliance tax increases excess disabled employment using a different empirical strategy on the same reform.

Lalive et al., 2013 conclude that the Austrian levy-quota system does indeed affect firms' demand for disabled workers,suggesting that a quota system can be used to promote employment of disabled workers.

## Evaluation of the Japanese quota system

Mori and Sakamoto, 2018 examine the effect of Japanese employment quota system for disabled workers on their employment in 2008. In particular, they study the effect on employment in the manufacturing industry.

The Japanese disability employment quota systems can be classified as a levy-grant-quota schemes. The system requires firms to pay levies if they are not able to achieve their quotas and it gives firms grants if they are able to achieve the targeted levels of disability employment. According to the 2008 disability employment policies in Japan, private firms with 301 regular workers or more were required to pay levies if they could not achieve their levy quotas. On the contrary, there was no legal obligation for firms with

[6] The average effect at higher-order thresholds (50, 75,...) is roughly twice as large, but imprecisely estimated.

300 regular workers or less to pay levies even if they were unable to achieve their levy quotas. The quotas were adjusted downward in industries where it seemed to have more difficult to employ disabled workers.

In the 2008 system, the quota for private firms was set to be 1.8% of the entire regular workforce. Japan's level at 1.8% was the lowest of all OECD countries in 2008. It was the responsibility of the employer to report the monthly number of disabled employment to the public employment agency. If the firm did not meet the quota the employer was forced to pay levies. The grant quota was set to 4% of the entire regular workforce. However, the grant quota was limited to a ceiling 6, in the sense that the grant quota was 6 whenever the value of firm size multiplied by 0.04 was greater than 6.

Mori and Sakamoto, 2018 have access to a survey conducted in 2008 by the Japanese Ministry of Health, Labor, and Welfare.

Empirically, the paper follow the threshold design strategy in Lalive et al., 2013, where the discontinuity at the threshold is exploited to obtain a causal estimate of the effect of the quota on firms around the threshold. Based on this strategy Mori and Sakamoto, 2018 conclude that if there is an obligation to pay levies, firms respond by meeting or exceeding the quotas. The estimate found in this study is larger than the estimate in Lalive et al., 2013. The quota system examined in Mori and Sakamoto, 2018 differs from the system in Lalive et al., 2013 in that the levy in Austria is about half of the levy in Japan, the thresholds are different, the quota level is lower in Japan, and the support offered by the government and the intensity of the monitoring is also different.

Mori and Sakamoto, 2018 argue that the larger estimate found in their paper compared to the estimate in Lalive et al., 2013 can be due to differences in social norms, support offered by the government and the intensity of the monitoring. They go on to argue that the support systems can be interpreted as the hidden aspects of the levy-grant scheme. Without these support systems, such as subsidies for ensuring barrier free workplaces and job training services, the levies would have to be increased in order to make firms achieve their levy quotas. They conclude that the Japanese 2008 levy-grant-quota scheme improved disability employment in the Japanese manufacturing industry.

# 3. Anti-discrimination laws

Disability discrimination laws seek to boost the employment of disabled workers by reducing discrimination and by requiring employers to provide ‘‘reasonable accommodations’’ to individuals with disabilities, allowing them to overcome barriers that may prevent them from working.

Anti-discrimination laws are in place in most OECD countries. In this section I will concentrate on the countries where the evaluations of the reforms are of highest quality. The best evaluated employment anti-discrimination law targeted disabled workers are the Title I of the Americans with Disabilities Act of 1990 (ADA), effective 1992 in the US and the Disability Discrimination Act of 1995, effective from 1996 (DDA), in the UK.

ADA bans discrimination against disabled workers in hiring, firing, wages, and in promotion. For example, a disabled worker must be paid the same amount as a non-disabled worker in the same job. ADA also requires employers to provide “reasonable accommodation” for their disabled workers. For example enabling wheelchair access, purchasing special equipment for disabled employees, and restructuring jobs to permit disabled employees to work part-time or from home. ADA initially covered all employers with at least 25 employees. In 1994, coverage was extended to employers with 15 or more employees. Enforcement of ADA is left to the Equal Employment Opportunity Commission and the courts. Disabled workers who believe that they have been discriminated against can file a charge with the Equal Employment Opportunity Commission, which will investigate and in some cases try to resolve the charge or go to court (DeLeire, 2000 and Acemoglu and Angrist, 2001).[7]

The Disability Discrimination Act (DDA) was passed in the UK in 1995 and came into force in 1996. The intention of the law was to end discrimination against disabled workers. Under the DDA, it became illegal for employers covered by the Act to discriminate against disabled workers. Just like in the ADA employers are required to make “reasonable adjustments” if their employment arrangements or premises place disabled workers at a substantial disadvantage compared with non-disabled workers. This includes the availability of special equipment and services. The Act originally covered employers with more than

[7] A business can only legally avoid providing an accommodation if it would cause ”undue hardship” to the nature of the operation (DeLeire, 2000)

20 employees.[8] In 2004 this exemption was removed and all employers regardless of their size were covered.

Economic theory suggests that these laws should reduce job terminations because terminating an employee, whether there is discriminatory intent or not, opens employers to the risk of legal action (Acemoglu and Angrist 2001). Tenure at jobs could also increase because the ‘‘reasonable accommodations’’ that the employer provides could increase job satisfaction, help manage health conditions, or increase productivity. Anti-discrimination laws forbid discrimination in hiring, which could increase hiring. On the other hand, theory also suggests that the increased cost or risk from terminating a protected worker makes hiring a protected worker costlier (Bloch 1994). Added to this are the costs of "reasonable accommodation" (or the costs of possibly being sued for not providing it), which further increases the expected cost of hiring (Acemoglu and Angrist 2001). Bloch, 1994 argues that anti-discrimination laws are expected to have a negative net effect on hiring of disabled workers as enforcement of the anti-discrimination laws are limited, and discrimination is difficult to prove or detect in hiring. Contrary, Button, 2018 argues that even absent the ability of these laws to reduce hiring discrimination, hiring could increase as the expansion of disability discrimination protections could increase awareness of disability-related issues and thereby motivate employers who are interested in projecting a good corporate image.

## 3.1 The effectiveness of anti-discrimination laws targeted disabled individuals

### Evaluation of the US anti-discrimination laws

There is a substantial literature evaluating the effects of the US anti-discriminations laws targeted disabled workers on labor market outcomes. The empirical results from these papers offer ambiguous predictions for whether the US disability anti-discrimination laws increase or decrease employment.

The first studies analyzing the ADA found a decline in employment for disabled workers after the introduction of the ADA, relative to individuals without disabilities (DeLeire 2000; Acemoglu and

[8] Firms employing 15 or more workers were covered from December 1998.

Angrist 2001). These studies have later been criticized for their empirical approach. The essential issue is that the studies lack a reasonable control group. As the ADA was implemented at a federal level at the same point in time and covers nearly all disabled workers it is difficult to construct a comparison group. Hence, these initial studies rely on before-after comparisons.

Another critique can be found in Kruse and Schur, 2003. They argue that a key problem in answering this question concerns the measurement of disability. Ideally, a researcher would have a clear and consistent measure of who is covered by the ADA, but no such measure exists. Thus, researches have to rely on proxies from available data sources. Kruse and Schur, 2003 found that the effects of the ADA varied depending on how disability was defined. They replicated the negative estimated effects of the ADA found in DeLeire, 2000 and Acemoglu and Angrist, 2001, using their disability measure. Kruse and Schur, 2003, however, found a positive effect of the ADA if disability was defined using other measures of being covered by the law. They go on to argue that the measure implying the positive effect are more reasonable.

Houtenville and Burkhauser, 2004 uses an alternative definition of disability and finds a positive effect of the ADA on employment of disabled workers. Hotchkiss, 2004 showed that the negative estimated effect of the ADA in previous studies was attributable to a reclassification of individuals without disabilities who were not in the labor force as disabled. Bound and Waidmann, 2002 and Houtenville and Burkhauser, 2004 note that the negative estimates are due to a general decreasing trend in the labor force participation rate of individuals with disabilities that started in the 1980s caused by lower eligibility criteria for receiving disability benefits.

Jolls, 2004 provides evidence that the ADA increased participation in education by individuals with disabilities in states in which the introduction of ADA was a substantial innovation compared to states in which they were not.

In the following, I will go in more detail with three studies where the identification strategies are most reliable. Beegle and Stock, 2003 studiy the effect of the legislation in place prior to the ADA. Jolls and Prescott, 2004 attempt to decompose the effect of the ADA into an effect of the ban of discrimination and the effect of the requirement of ‘reasonable accommodations’’. Button, 2018 evaluates an extension to the ADA in the state of California, to understand the effect of the law on individuals with less-severe

disabilities. All three studies rely on legislative variation across states to construct reasonable control group.

Beegle and Stock, 2003 study the effect of the state-level anti-discrimination policies in place prior to the ADA in 1990. They provide evidence that disability discrimination laws varied widely across states with respect to their coverage of physical and mental disabilities, their application to private sector employment, and their requirements for reasonable accommodation by employers. They also found evidence of state variation in the breadth of their enforcement and their establishment of stipulated sanctions. They exploit this variation in state-level legislation that existed prior to the introduction of ADA to identify groups of disabled workers in the same period who are and are not covered by anti-discrimination laws. Specifically, they apply a difference-in-difference-in-difference approach where they compare labor market outcomes (earnings, employment, and labor force participation) of disabled and non-disabled workers across time and states.

They claim that by ignoring the impact of this preexisting state-level legislation, measures of the effect of ADA will understate its impact when considered against a counterfactual of ADA introduced into a world with no previous disability discrimination laws.

They have access to data from the 1970–90 decennial U.S. Censuses of Population. The results show that the anti-discrimination laws available prior to ADA were associated with marginally lower labor force participation rates and lower relative earnings for the disabled workers, but they find no systematic relationship between the laws and employment rate of disabled workers once preexisting employment trends are controlled for.

Jolls and Prescott, 2004 attempts to isolate and evaluate the two distinct parts of ADA. Namely, ban of discrimination and the effect of the requirement of reasonable accommodations. The empirical strategy exploiting the same source of variation as Beegle and Stock, 2003. They use the substantial state-level variation in disability anti-discrimination laws that existed prior to ADA, but then go on to investigate the state level change in laws caused by the introduction of ADA. In the period prior to ADA some states had laws prohibiting discrimination of disabled workers while others had laws requiring employers to implement reasonable accommodations for disabled workers. They exploit the variation along these to margins to estimate the effect of the ban of discrimination and the effect of the requirement of reasonable

accommodations in ADA. The empirical model is as in Beegle and Stock, 2003 a difference-in-difference-in-difference estimation.

They use data from the Current Population Survey from the period 1988-1998, and find that the introduction of ADA caused a 10 percent decline in the employment of disabled workers. This was in the years just after the introduction of the law, in states where the law's reasonable accommodations requirement was an innovation compared to states in which a similar requirement existed at the state level prior to the introduction of ADA. The result is in contrast to Beegle and Stock, 2003 where no significant effect was found. Jolls and Prescott, 2004 argue that this might be due to imprecise information on state legislation used in Beegle and Stock, 2003. However, as Beegle and Stock, 2003 do not evaluate ADA, but explicitly the laws in place prior to the ADA, this might also be the cause of the diverging results.

Jolls and Prescott, 2004 find little to no effect of the ADA on the employment of disabled workers in states where laws prohibiting discrimination of disabled workers was an innovation, compared to states with similar preexisting prohibitions.

They then go on to conclude that the results suggest that the reasonable accommodations requirement of the ADA, rather than the ban of discrimination is the cause of the short term negative effects on employment of disabled workers previously found in the literature.

Button (2018) evaluates the Prudence Kay Poppink Act, which broadened disability employment discrimination law to cover individuals with less-severe disabilities by lowering the burden of proof to establish a disability in 2001 in California, US.

Because the requirements to be considered disabled under the ADA were demanding a significant portion of individuals with less-severe disabilities were not covered by the laws. Button, 2018 exploits a change in the disability discrimination laws in California which expanding legal protection to additional persons with less-severe disabilities. The new legislation both broadened who were considered disabled and expand the reasonable accommodations requirements.

Button uses data from the Current Population Survey's Annual Social and Economic Supplement which covers the period from 1994 to 2007. He follow three empirical strategies: i) a difference-in-difference strategy where disabled workers in California and in other states are compared before and after the

reform, ii) comparing individuals with and without disabilities in California before and after the reform, and iii) a difference-in-difference-in-difference strategy combining strategy i) and ii).

The results in Button, 2018 suggest that the Prudence Kay Poppink Act led to a substantial increase in the employment of disabled workers. The authors' preferred estimate is a 3.8 percentage increase in the probability of being employed, on average, over six years after the Prudence Kay Poppink Act was in effect. Button, 2018 argues that this effect is large relative to the employment-to-population ratio for disabled workers in California of 25.5 percent in the year prior to the reform. It is important to note that the individuals affected by this reform were individuals with less severe disabilities, as the anti-discrimination law already covered individuals with severe disabilities.

## Evaluation of the UK anti-discrimination laws

Bell and Heitmueller, 2009 evaluate the Disability Discrimination Act (DDA) in the UK put into force from December 1996. They apply a difference-in-difference strategy to model the probability of employment among disabled workers compared to nondisabled workers. A strategy similar to what is used in the early papers studying the US anti-discriminations laws (DeLeire, 2000 and Acemoglu and Angrist, 2001). The primary data source used in this study is the British Household Panel Study for the period 1991-2002, which covers about 5000 household per wave.[9] The authors find that the DDA resulted in a decline or, in the best case, in a levelling off in employment rates of disabled workers in the years after the reform. Thus, the results in Bell and Heitmueller, 2009 are in line with what is found in DeLeire, 2000, Acemoglu and Angrist, 2001 on the US anti-discriminations law. Bell and Heitmueller, 2009 argue that the absence of a significant employment effect is due, among other reasons, to low awareness of the act.

Jones and Jones, 2008 evaluate the effect of the repeal of the small firm exception in 2004. Prior to 2004 firms with less than 15 workers were exempt from DDA. After the repeal in 2004 all workers were covered. Jones and Jones, 2008 uses data from the Quarterly Labour Force Survey in UK for the years 1997-2006 to study the reform. Jones and Jones, 2008 apply a difference-in-difference strategy as in Bell and Heitmueller, 2009, DeLeire, 2000, and Acemoglu and Angrist, 2001, where the nondisabled workers

[9] They also study the reform using the British Family Resource Survey.

are used as the control group. The results from using this procedure does not indicate that the reform had a significant effect on the employment rate of the disabled workers. Jones and Jones, 2008 also study the effect of the reform on earnings of disabled workers but do not identify a significant effect on earnings. They conclude that the results of their paper is consistent with the evidence from Bell and Heitmueller, 2009 who also find no positive employment effects of the introduction of the Disability Discrimination Act.

# 4. Experience rated disability insurance

Employers can take precautionary measures to reduce the onset of health problems and to provide accommodation if health problems should occur at the workplace. This can be done by investing in measures such as workplace health and safety, reallocate the workload, modify job assignments, and provide assistance and retraining. Unfortunately, the employers incentives to implement preventing and accommodating measures can be weak. It is to be expected that the incentives of the employers are less than socially optimal.

Experience rating of disability insurance premiums is put in place to mitigate this incentive problem.

The goal is that the experience rating of disability insurance premiums forces the employers to internalize the societal costs of disability benefit claims and thereby encourages them to implement cost-effective disability reducing measures, leading to lower disability benefit enrollment.

Experience rating is a system where the disability premium of the employer is adjusted to reflect the costs of its workers' past disability benefit claims in comparison to other employers. Employers with high disability costs are penalized through a surcharge on top of the base premium, and employers with low disability costs are rewarded by giving a discount on the base premium.

Experience rating is used in many other types of social insurance, such as in workers' compensation and unemployment insurance schemes, but it is still rare in the context of disability insurance. Experience rating in the disability insurance system is only in use in Finland and the Netherlands (Kyyrä and Paukkeri, 2018). In the following I will describe the experience rating system in the Netherlands and in Finland and the evaluations of these systems. The effectiveness of these systems are typically evaluated by the effect on the inflow into disability insurance. However, Tompa et al., 2012 conduct a literature

review on the effectiveness of experience rating on occupational safety and health performance. They find moderate evidence that its introduction of experience rating is associated with a lower frequency of injuries and lower frequency and severity of injuries

## 4.1 The effectiveness of experience rated disability insurance

## Evaluation of experience rating in the Netherlands

Experience rating was introduced in 1998 in the Dutch disability insurance system. As a response to the high inflow into disability benefits, employers were to bear the costs of the first 5 years of DI benefits. In 2006, the employer payment was extended to the first 10 years. The experience-rated disability insurance premium of Dutch firms was based on the individual disability risk of a firm. In 1998 the time window for disability risk was five years. Disability risk of a firm was calculated by dividing the sum of disability cost for previous employees with the sum of wages. Both measures were calculated with a delay of two years and averaged over the five years previous to that. In addition, the firm DI premium that follows the individual disability risk is capped by the minimum premium and the maximum premium. This means that every firm pays at least a uniform minimum premium. Higher disability costs result in proportionate increases in the DI premium up to the maximum premium. The values of the minimum and maximum premiums vary with respect to firm size. Initially, small firms were defined as having total wage costs that are smaller than the average wage costs per worker in The Netherlands, multiplied by 15. Maximum premiums are set equal to four times the average premium for large firms and to three times the average premium for small firms.

In 2003, experience rating was abolished for small firms. In 2004, the coverage of experience rating across firms was further reduced, as the group of small firms was extended from 15 to 25 times the average wage costs. In 2008, experience rating was re-introduced for all firms irrespectively of firm size.

Koning, 2009 evaluates the 1998 reform, which introduced firm experience rating in the Dutch disability insurance system. He uses a difference-in-difference approach to identify the impact of changes in premiums on the inflow into disability insurance. This is done by comparing disability insurance inflow rates between employers who had and had not yet experienced premium raises due to the introduction of experience rating. This method is preferred as the study only has access to post-reform data (2000-2002).

Koning, 2009 estimated the effect of employer premium raises to amount to a 15% reduction in the disability insurance inflow after 1 year. This estimated impact of experience rating on disability insurance inflow is substantial. Koning, 2009 argues that employers have been pushed to increase their preventative activities once experience rating was introduced and the premiums were substantially increased. Koning, 2009 interprets this as evidence that employers were not completely aware of experience rating and therefore the premium change served as a wake-up call, which induced preventative measures that reduced the disability events in subsequent years. Koning, 2009 and Hyatt and Thomason, 1998 argue that the awareness of the reform among the employers was initially limited which limited initial effect of the reform.

Van Sonsbeek and Gradus, 2013 have access to aggregate sector data for the period 1999-2010. They regress the aggregate disability inflow rate against a set of policy-relevant variables, including the gradually increasing degree of experience rating. The results in van Sonsbeek and Gradus, 2013 imply that experience rating has reduced the disability inflow by 13%. However, the study is (just like Koning, 2009) limited to using data only from the post-reform years and lack a comparison group that would not have been subject to experience rating.

De Groot and Koning, 2016 exploit the removal of experience rating for the group of small firms that took place in 2003. Small firms were defined as having total wage costs that are smaller than the average wage costs per worker in the Netherlands, multiplied by 15. The removal of experience rating is used in a difference-in-difference design, where large firms are used as the control group for which the experience-rating incentive did not change. De Groot and Koning, 2016 evaluate whether the removal of experience rating increased the DI inflow and decreased DI outflow rates. They use data for the period 2001-2004, two year before and two years after the reform.

The results of the paper imply that the removal of experience rating in 2003 increased the flow into disability insurance for small firms by about 7%, whereas disability insurance outflow of individuals from small firms decreased by about 12%. These results amount to a 0.4% larger stock of disability insured in 2004 because of the reform. The effect size in this paper is about half of what was found in van Sonsbeek and Gradus, 2013 and Koning, 2009. The effect on the disability insurance outflow is due to partially disabled workers. They also find evidence that the cap that was used for experience-rated

premiums had substantial disincentive effects. Firms paying the maximum premium had higher disability insurance inflow rates and lower disability insurance exit rates.

Koning and Lindeboom, 2015 criticize the introduction of firm experience rating in 1998 in the Netherlands for putting too large financial risk on the employer. Koning and Lindeboom, 2015 illustrate this by the following example: Suppose a worker becomes fully disabled. Then the employer has to pay full wages for 2 year during a sickness insurance period and then after this period has to pay for 5 year of disability insurance benefits (10 year after the 2006 reform). They argue that this might affect the hiring decision of the employers. At the time of the reform, the employers were allowed to hire on temporary contracts and then the cost for potential disability will be paid by a collective fond. This will encourage the employers to hire individuals potentially at risk of becoming disabled on temporary contracts to avoid the financial risks. As a response to this, the Government in the Netherlands in 2016 implemented a policy making the employers responsible for paying sickness and disability insurance benefits for individuals on temporary contracts.

## Evaluation of experience rating in Finland

Finnish firms have been partially responsible for the disability benefit costs of their employees since the 1960s. In Finland, the employers are subject to various degrees of experience rating depending on their size. The smallest firms are not subject to experience rating at all, whereas the largest firms are fully experience rated (in the sense they only pay experience-rated disability insurance premiums). Among the medium-sized firms the degree of experience rating increases linearly from 0 to 1 with firm size. The thresholds for when a firm is subject to the experience rating is based on firm size and has been subject to reform over time. The experience rating threshold corresponds approximately to a firm size of 50 employees (before 1996 the cutoff was at 300 employees) (Korkeamäki and Kyyrä, 2012, Kyyrä and Paukkeri, 2018). Small firms pay a fixed, age dependent, premium per employee.

Korkeamäki and Kyyrä, 2012 note that the Finnish experience rating system differs from the Dutch in that the employer's liability is not limited to the first 5 years of disability benefit costs. In Finland, the system used to be that the disability event causes a lump-sum payment, having no effect on the pension contributions thereafter, but in 2006, the system was reformed so that the lump-sum payment was abolished and replaced with an experience-rated payroll tax. The degree of experience rating varies much

more across firms of different size in Finland than in the Netherlands. In addition, the Finnish experience rated premium is much more complex to calculate and thereby much less transparent for the employers. Kyyrä and Tuomala, 2013 argue that the complexity of the premium calculations, limits employer awareness and the transitional provisions associated with the pension reform.

Korkeamäki and Kyyrä, 2012 evaluate a reform in Finland in 1996 where the threshold for experience rating in the premiums was changed from approximately 300 employees to approximately 50 employees.[10] They run a logit regression, where they exploit the 1996 change in the relationship between the cost share and firm size for identification. They find significant effect of experience rating on the inflow into sickness benefits and the transitions from sickness benefits to disability benefits. They argue that experience rating of disability benefit costs seems to be an effective policy instrument. It seems to induce employers to take preventive actions to reduce the inflow into sickness benefits, as well as to put more effort to get their employees on sickness benefits back to work.

Kyyrä and Tuomala, 2013 also estimate the effects of the Finnish experience rating system. They exploit a reform in 2007, which unified the private sector pensions. The reform meant that the experience rating of the disability insurance premiums was extended to cover a new group of workers and their employers who previously were not covered. The reform affected medium-sized and large firms, which became subject to experience rated disability premiums for their employees who used to be insured under regulations without experience rating. The smaller firms in the same industries were not affected by the reform. Kyyrä and Tuomala, 2013 use this variation to estimate the effect of introducing experience rating by applying a difference-in-difference strategy. Using data for the period 2005-2010 the paper finds no significant effect of experience rating on the disability inflow. In the reasoned paper Kyyrä and Paukkeri, 2018 argue that these results are inconclusive and preliminary due to the short follow up period.

Kyyrä and Paukkeri, 2018 evaluate the effect of experience rating on disability flows using the thresholds in the rules that specify the degree of experience rating as a function of firm size. They apply a regression kink design. This method can be used to identify the effect of experience rating for firm around the firm size thresholds. The main identifying assumption is that the effect of firm size on disability risk is smooth around the thresholds. They have data available for all private firms during the period from 2007 to 2015.

[10] The actual cut-offs were based on the complex calculation mentioned above.

They find no effect of experience ration on the inflow to disability insurance using the full sample, but when they use subgroups they find that men below the age of 50 are significantly affected. The results suggest that experience rating for this particular group significantly reduced the inflow into disability insurance. It is however worth noting that men below the age of 50 only account for eight percent of the stock of disability insured at the time of the study. Kyyrä and Paukkeri, 2018 go on to conclude that experience rating in disability insurance has no notable impact on the overall disability flow in the Finnish labor market.

# 5. Wage subsidies

Wage subsidies aim at increasing the demand for work by reducing labor costs of employing disadvantaged workers (Kaldor, 1936, Kessleman, 1969, Phelps, 1994, Calmfors, 1994). The subsidies can take the form of direct payments, a reduction of taxes or social security contributions.

Targeted employer-side subsidies are advocated as a flexible and efficient tool to improve employment because job creation and hiring decisions are left in the hands of private firms, while costs are partially borne by the government (Katz, 1996). In this sense wage subsidies schemes are compatible with the principles of social market economy and reward employers for showing a desired behavior instead of forcing them into compliance (Semlinger & Schmid, 1985).

Four dimensions, which are particularly relevant to the description and comparison of schemes for disabled people, are the target population, the eligible employers, the subsidy rate, and the subsidy duration (Samoy and Waterplas, 2012).

In contrast to wage subsidy schemes for other groups (such as the unemployed), a particular feature of subsidy schemes targeting the disabled is that both current and new employees can be granted a subsidy. Furthermore, especially relevant for such schemes is that the productivity of unemployed or out-of-the-labor force disabled individuals is to a larger extent unknown to employers relative to the productivity of their own disabled workforce (Datta Gupta et al., 2015).

Subsidy schemes can differ as to eligible employers. Some are targeted exclusively at the private (profit or non-profit) sector or at the public sector; others cover both sectors.

The subsidy rate may be set at different levels and remains unchanged for the whole subsidy period or vary over time according to a set schedule. Subsidies may be calculated as a fixed amount (or a set of such amounts) or as a fixed rate, i.e. a percentage of eligible labor costs.

Subsidies usually have a limited duration, ranging from of few weeks to a few years, the assumption being that the subsidy period will allow the worker to prove he or she can contribute to the activities of the business or organization, and full productivity will have been reached by the time the subsidy expires.

Permanent wage subsidy schemes are implemented in countries such as Belgium, Denmark and France. The idea here is that people with a disability are less productive, and that their permanently lower productivity needs to be compensated. Temporary subsidy schemes have been implemented in countries such as Austria and Sweden. Some of the rationale behind these subsidy schemes is that on-the-job training for people with disabilities takes more time, but that the productivity gap can be closed (Deuchert and Kauer, 2017), so that disabled workers can compete on the regular labor market. In the long run, wage subsidies are expected to have positive effects on employment prospects by providing on-the-job training and work experience (Neubäumer, 2010), and to reduce employers' uncertainty about the employability of job applicants (Jaenichen & Gesine, 2007).

Wage subsidy schemes may however also have adverse effects. Participants may suffer a "locking-in effect" because having a subsidized job limits their search for a non-subsidized job (Bernhard, Jaenichen and Stephan, 2008, Van Ours, 2002, and, Jaenichen and Stephan, 2011). Targeting of subsidies may also be stigmatizing and negatively affect employment opportunities of the target group (Marx, 2001). Deadweight losses can occur when the scheme subsidizes hiring that would have occurred anyway. Substitution effects are found when employment gains among targeted workers come at the expense of other workers in the firm, who are replaced by subsidized workers. Subsidized workers may themselves in turn be replaced by new subsidized workers at the end of the subsidy period, this process is referred to as a churning effect (Burns, Edwards & Pauw, 2010).

A targeted wage subsidy is related to a targeted labor tax credits. In a competitive labor market these two outcomes would resolve in an equivalent outcome. However, if wages cannot adjust downwards (due to minimum wages or union contracts), a wage subsidy may reduce the labor costs and therefore increases

labor demand and employment more than a reduction in the labor income tax paid by the employees (Huttunen et al., 2013).

## 5.1 The effectiveness of wage subsidies targeted disabled individuals

In general, the literature on wage subsidies for disadvantaged groups finds modest positive effects on employment and in some cases small substitution effects (Bell et al., 1999, Blundell et al., 2004, Kangasharju and Venetoklis, 2007. Girma et al., 2008, Rotger and Arent, 2011, Betcherman et al., 2010). However, little evidence exists on the effectiveness of wage subsidies targeted disabled workers. In the following, I will go through the most reliable evaluations in the field.

The most commonly referenced evaluation in the literature evaluates the Danish permanent wage subsidy for partly disabled workers - Fleksjob (Datta Gupta and Larsen, 2010). In this Section, I will carefully go through the Danish Fleksjob wage subsidy scheme and the evaluations of it.

I found two evaluations of the Spanish wage subsidy system (Jiménez-Martín et al., 2017, Castello, 2012). The Spanish system is interesting as it is very different from the Danish. The system consists of a lump-sum subsidy payed upfront to the employer for taking on the disabled worker for at least a previously specified period.

Angelov and Eliason, 2014 evaluate the Swedish wage subsidy program targeted disabled workers in place in 2004. The system has many similarities to the Danish, but differ from the Danish systems in that an employer can only receive wage subsidies for a certain employee during at most four years. In this sense, the program is temporary. It is however the case that there is no limit at the individual level.

Recently, Baert, 2016 and Deuchert and Kauer, 2017 have added causal estimates to the literature using randomized controlled trails. While these studies offers highly reliable results, they are unfortunately limited to evaluate the effect of wage subsidies for disabled workers on call-back rates. This is indeed a relevant margin, however, the main margin of interest when evaluating the effect of targeted wage subsidies should be the rate of employment. In addition, both of these studies suffer from small sample sizes, which decrease the external validity of the results. Both papers are discussed further in the text below.

## The Danish permanent wage subsidy scheme - Fleksjobs

On January 1 1998, the Danish government put into force a law introduced by the Ministry of Social Affairs creating permanent wage-subsidized jobs for the long-term disabled known as the Fleksjob scheme.

Under the Fleksjob scheme, jobs are both subsidized and associated with special working conditions, e.g., reduced working hours and/or the absence of physically demanding or stressful tasks. To be eligible for a subsidized job, the individual must have suffered a considerable and permanent reduction in working capacity and must have exhausted all other avenues of obtaining unsubsidized employment as determined by the competent local government authorities. Employers who hire eligible workers are entitled to a partial wage subsidy. The subsidy graduate according to the degree of reduction of working capacity, corresponding to either 1/3, 1/2 or 2/3 of the wage. Unlike many other wage subsidy programs, the Fleksjob subsidy was unlimited in duration existing as long as the worker retains the job.

One year after the introduction of the Fleksjob scheme, on January 1st 1999, a circular letter came into force, granting government institutions reimbursement of all wage expenses paid to individuals granted a Fleksjob. Other firms (private, municipal, and regional sectors) were still subject to a subsidy of 1/3, 1/2 or 2/3 of the wage depending on the assessed reduction working capacity of the individual.[11] In May 2002, this additional reimbursement to government workplaces was reduced to cover only half of the amount not reimbursed by the normal Fleksjob scheme for those granted a Fleksjob after April 1st 2002.

As of Januar 1st, 2013 the Fleksjob scheme was subject to a major reform. The scheme was transformed from a permanent scheme to a potentially temporary scheme. In the new system the first Fleksjob is of a duration of 5 year. If the disabled worker is above the age of 40 and is still eligible to the Fleksjob scheme after the 5-year period, then the second Fleksjob can be granted as a permanent transfer. All Fleksjobs for individuals below the age of 40 are granted for 5-year periods, with meeting at Jobcenter including eligibility assessments every 2.5 years.

A Fleksjob at a current employer requires (with some exceptions) a one year waiting period, where the employer has attempted to accommodate the work environment. The employer writes a letter on this to

[11] Limited to the two groups 1/2 and 2/3 after July 2002.

the Jobcenter and the Caseworker thereafter can grant the Fleksjob. After the reform, the employer only had to pay for the effective working hours at the workplace. It is the responsibility of the Jobcenter to determine the necessary time-use of the individual per effective working hour at the workplace. The employer only pay wages for the effective hours at the workplace. The municipality supplement the wage with transfers. The total income cannot be above the earnings for fulltime employment in the job. [12]

Datta Gupta and Larsen, 2010 evaluate the original Fleksjob scheme, which was introduced in 1998. They do this by exploiting the exogenous variation arising from the introduction of the scheme in 1998. They use data from two independent cross-section surveys from 1994 and 2001 to assess whether the Fleksjob scheme for the disabled in Denmark, has been effective in raising the employment and lowering their benefit receipt of the disabled workers. They do not have information on which individuals participated in the Fleksjob scheme or who is eligible, so they proxy the eligible worker by self-reported health. They estimate an intention-to-treat effect using a difference-in-difference-in-difference design, where the control groups are long-term disabled without work capacity reduction (N=245) and short-term disabled with work capacity reductions (N=53). The treatment group is long-term (3 years) disabled with work capacity reduction (N=149). They find an effect on the probability of employment but not on disability receipt. For the long-term disabled with a working capacity reduction in the 18-49 age group, employment probability is raised by 33 pct. points after the scheme was introduced relative to a mean employment rate at a baseline of 44%. Based on these results they argue that wage subsidies in a settings like the Danish with universal health insurance and little employment protection can strongly increase employment among the relatively healthy disabled.

Datta Gupta and Larsen, 2010 argue that measurement issues can arise when comparing the two data sets because disability is self-reported and because it is difficult to make consistent definitions of eligibility across the two data sets.

They note their uncertainty about whether this effect can be interpreted as causal because the subsidized jobs in the analyzed period may have been granted to relatively more employable disabled individuals. Deuchert and Kauer, 2017 question the choice of control group, and thus the reliability of the results Datta Gupta and Larsen, 2010.

[12] See Deloitte, 2018 for descriptive statics on the participants in the Fleksjob scheme.

Datta Gupta et al., 2015 evaluate whether a change from full to partial reimbursement to governmental workplaces affected the share of Fleksjobs allocated to retained versus non-employed hires.

They exploit a change in the reimbursements of the Fleksjob scheme for disabled workers implemented in 2002. In 2002, the reimbursement to governmental workplaces was lowered from full to only partial reimbursement while the reimbursement to private, municipal and regional employers remained the same. Datta Gupta et al., 2015 analyze whether this change in the wage reimbursement amount led to a change in the hiring strategy among governmental units compared to the remaining part of the public sector (municipal and regional units). They apply a difference-in-difference strategy on administrative data where governmental units are used as the treated group and municipal and regional units as a control group.

They find that lowering the reimbursement changed governmental units preferences from hiring new Fleksjob employees from non-employment to retaining existing employees. Governmental units were less inclined to hire disabled workers from non-employment and much more inclined to take in Fleksjob hires from within (both relative and in absolute numbers). They argue that the decrease in the financial incentives made the employers less willing to take the risk of hiring individuals from non-employment, and more prone to resort to employees for whom their productivity was already known due to the uncertainty associated with the hiring of disabled individuals.

Datta Gupta et al., 2015 do not claim to be able to make causal statements on the effect of the subsidy change on total employment creation, but they do observe that governmental units decreased their total hiring through Fleksjobs after the reform.

It is also worth noting that both Datta Gupta and Larsen, 2010 and Datta Gupta et al., 2015 evaluates the Flexjob scheme prior to the major reform in 2013, where the scheme was transformed from a permanent scheme to a potentially temporary scheme.

## The Spanish hiring subsidies for disabled individuals

In 1981, employment subsidies specifically targeted to disabled individuals were established in Spain at the national level. The system consists of two types of subsides. First, employers are granted a deduction to the Social Security contributions that the employer has to pay when employing a disabled individual.

The deduction was 70% for disabled individual younger than 45 and 80% for disabled individuals aged 45 or older. The other part of the subsidy system was a hiring subsidy (e.g. a lump-sum one-time subsidy) granted to the employer at the time that he/she hired the disabled individual. Employers were entitled to the subsidies if they hired the disabled individual on a permanent contract. The scheme obliges the employer to maintain the subsidized worker in employment during a certain amount of time. If the employer fires the worker, he/she has to reimburse the subsidies received when the hiring took place.

The national level subsidy scheme has been extended over time at different rates and with different intensity across the Spanish regions. Jiménez-Martín et al., 2017 group these extensions into hiring subsidies to foster two other forms of employment besides permanent employment. E.g. temporary employment and conversions from temporary to permanent employment. The amount of each type of subsidy has increased (in some cases conditional on the gender and/or the degree of disability of the individual) and the duration of the employment protection has increased (between 5 and 20 quarters). As a result, the hiring subsidies scheme for disabled workers in Spain differs substantially across regions.

Jiménez-Martín et al., 2017 evaluate the effectiveness of part of the employer subsidy scheme targeted towards the disabled implemented in Spain, consisting of a one-time lump-sum payment granted to the employer that hires a disabled individual. They exploit this timing in the implementation at the regional level in a differences-in-differences strategy in order to estimate the effect of the subsidy scheme on the employment outcomes of the disabled workers. They use administrative data for the period 1990-2014. They estimate the effect of the introduction of the subsidy scheme on the probability that disabled individuals find a job under each the subsidized employment types (temporary employment, permanent employment and conversions from temporary to permanent employment). The results show that, in general, the subsidy scheme is ineffective at incentivizing transitions to each of the three types of subsidized employment. They do however find some indications of an effect on specific subgroups. They find that subsidies promoting permanent employment for unemployed disabled individuals are effective at increasing transitions to both temporary and permanent employment for older individuals, They also find that subsidies incentivizing conversions from temporary to permanent employment are effective at promoting this type of conversions for disabled women. On the other hand, they find that conversion subsidies have a negative effect on the transition rate from temporary to permanent employment for disabled men and for disabled individuals between 36 and 50 years old.

They argue that the results in the paper show that the employment protection requirements in the scheme is effective at protecting subsidized disabled workers against unemployment once they are hired, but the results also show that, for unemployed disabled individuals, a higher degree of employment protection is associated with a decrease in the probability of being hired under a permanent contract and an increase in the probability of being hired in a temporary basis. Based on these results Jiménez-Martín et al., 2017 argues that attracting these types of protection measures to the employer subsidy scheme may reduce the effectiveness of the scheme. They go on to conclude that the one-time lump-sum payment granted to the employer that hires a disabled individual is in general ineffective at incentivizing transitions to employment, and in some cases it is associated with an increased propensity of transiting to disability insurance.

Castello, 2012 evaluates an extension to the Spanish employer subsidy scheme, which was specifically targeted women. They analyze whether the reform increased the probability that disabled women entered employment. In 2004 the deduction in Social Security contributions was increased for employers who hired women. The deduction of 70 percent for disabled individual younger than 45 was increased to 90 percent for women and the deduction of 80 percent for disabled individuals aged 45 or older was increased to 100 percent for employers who hired women.

Castello, 2012 applies a differences-in-differences strategy using women as the treated group and controlling for differential pre-existing employment trends between women and men. Using administrative data, she finds that the increase in the deductions to the Social Security contributions for disabled women resulted in a significant increase in their employment rate. Specifically, she estimates an average elasticity of employment with respect to Social Security contributions of 0.08 for fully disabled women and 0.14 for partially disabled women. The results also show that the elasticity of employment is higher for the group of women below age 45 for both partially and fully disabled women. They conclude that increasing the deductions to the Social Security contributions paid by the employer provides an incentive for employers to hire disabled women. It is however less clear from the paper whether the effect was caused by an increase in total employment or due to substitution from men to women.

## The Swedish temporary wage subsidy scheme

Both private and public units are eligible in the Swedish wage subsidy scheme if they meet a set of legal requirements such as being registered as an employer at the Tax Agency, not having records of non-payment at the Swedish Enforcement Administration, and having a collective agreement or comparable employee protection insurance. The purpose of the scheme is to increase employment of disabled individuals by wage subsidies compensating for job-related or workplace-related adjustments at the firm (Angelov and Eliason, 2014). Both employed and unemployed disabled individuals are eligible for the scheme. The Swedish system differs from the previously described Danish system in that an employer can only receive wage subsidies for a certain employee during at most four years. In this sense, the program is temporary. It is however the case that there is no limit at the individual level. The amount of wage subsidies are a function of the wage of the employee and the level of work capacity. The normal maximum subsidy is 80 percent, but the employer can receive reimbursement for additional cost in addition to the wage subsidy for workers with a high degree of disability. The Public Employment Service has the responsibility of monitoring and providing additional support for both the firm and the workers during the program.

Angelov and Eliason, 2014 evaluate the Swedish wage subsidy program targeted disabled workers in place in 2004 (described above).[13] They take advantage of the large set of background information available in the administrative registers, by using a propensity score matching approach. They recognize the limitation of the method and therefore restrict the group of controls to individuals who also are eligible for program participation. They argue that this allows them to compare eligible individuals who participate in the program, with matched not-yet treated eligible individuals. They find significant positive average treatment on the treated effects of the program both in terms of the probability of employment and in terms of (labor and disposable) income of the individual. They find that the effects are large during the initial program period, but that they also persists five years after the start of the program. They, however, also observe a shift from non-subsidized employment to subsidized employment (a locking-in effect).

[13] Angelov and Eliason, 2014 also study the effect of two forms of sheltered employment (sheltered public employment and employment at Samhall, a state-owed company.

## Evaluations of the effect of wage subsidies for disabled individuals on callback rates

Baert, 2016 evaluates the effect of the Flemish wage subsidy scheme in place during the period 2012-2013 on the callback chances of the disabled individual. Employers who recruited a disabled individual were entitled to a wage subsidy of between 20 and 60 percent of the total wage costs. The compensation varied by the severity of the disability. The wage subsidy was granted for a five-year period. However, extensions of the period was possible as long as the employer could argue that the disability of the employee still resulted in a productivity loss. The subsidy was gradually decreased during the five-year period.

Baert, 2016 conducted a field experiment to evaluate the effectiveness of wage subsidies in terms of callback rates. He uses a correspondence experiment to test whether disclosing entitlement to a Belgian wage subsidy enhances the likelihood of disabled persons receiving a positive response to a job application (an audit study). Two applications for male graduates, identical except that one disclosed a disability, were sent out to 768 vacancies in the Flemish labor market. In the experiment, pairs were randomized in which the disabled candidate also mentioned entitlement to a wage subsidy, amounting to between 20 percent and 40 percent of the total wage cost, and pairs in which the disabled candidate did not. Monitoring the subsequent callback enabled Baert, 2016 to identify heterogeneity in the unequal treatment of disabled and nondisabled applicants by wage subsidy entitlement disclosure.

He finds that when not disclosing wage subsidy entitlement, the disabled candidates had a 47 percent lower chance to receive a positive reaction from the employer than the nondisabled candidates did. When disclosing wage subsidy entitlement, the disabled candidates had a 49 percent lower chance to receive a positive reaction. The two statistics are not significantly different. Based on these results Baert, 2016 concludes that the results show that the likelihood of a disabled candidate receiving a positive response to a job application is not influenced by disclosure of wage subsidy entitlement in Belgium.

Deuchert and Kauer, 2017 conduct a similar study to Baert, 2016. They evaluate the effectiveness of the Swiss training subsidy scheme for disabled worker during the period 2011-2013 on the callback chances of the disabled individual. The Swiss wage subsidy scheme took effect in January 2008. It provides employers subsidies for hiring disabled workers for up to 180 days of an amount of up to 80 percent of

the previous wage of the employee. With the additional requirement that the subsidy cannot exceed the current wage including social security contributions of the worker. Deuchert and Kauer, 2017 note that in practice the scheme was rarely used.

Deuchert and Kauer, 2017 conduct a field experiment among individuals who are eligible for the wage subsidy. Participants in the experiment write several applications. The applications randomly disclose the availability of the subsidy to a potential employer. The effectiveness of the wage subsidy is measured by callback rates for interviews. The study includes 52 participants who send out a total of 384 applications to different employers. Overall, the results show that wage subsidy is ineffective in increasing the callback rates for disabled workers. However, they do find variation in the results by subgroups. They argue that the subsidy seems to be ineffective or even counterproductive in a group of adolescents, who were at the end of their vocational training program, but it is likely to have increased callback rates in a group of clients of job-coaching services. They conclude that the results are quite similar to the results in Baert, 2016 in that callback rates are not positively associated with the disclosure of wage subsidy entitlement.

# 6. Supported employment

Supported employment is defined as vocational rehabilitation in which the participant is supported in finding regular employment as quickly as possible without or with very little preparatory training. The support continues during the employment spell and the potential necessary skill development is also contributed after entered employment (Crowther et al., 2001, Burns et al., 2007, Larsen and Høgelund, 2014, Nøkleby et al. 2017). The principle of supported employment is to move from a traditional "train-then-place" vocational rehabilitation strategy to a "place-then-train" strategy.

The empirical evidence on supported employment programs for disabled workers is weak and unstructured. High quality evaluations are available for specific types of programs, but very little has been done in order to decompose and understand why and which parts of the programs that have the intended effects. Supported employment policies are often targeted groups of individuals with specific work limitations. In the following, I will go through policies designed for broader groups of disabled workers. I will however make a distinction between programs for individuals with mental health disabilities and programs for people with physical and chronical disabilities.

## 6.1 Mental health disabilities

### Individual Placement and Support

The Individual Placement and Support (IPS) is a specific type of supported employment, which helps individuals with severe mental illness to find and keep regular employment. At the center of this approach is a job coach. The job coach acts as a coordinator and has the responsibility of helping the participant in obtaining and keeping a job. This involves providing support for the participant, the employer, and the colleagues. In the pre-employment process this involves providing support in the job search process, e.g. writing applications, interviews, and finding relevant job matches (Becker and Drake, 2003). A key feature in the program is that the participant takes part in the decision process of job type and job placements. The core principles of this model are (1) a focus on competitive employment, (2) eligibility based on participant choice, (3) rapid job search, (4) integration of mental health and employment services, (5) attention to participant preference in the job search, (6) individualized job supports and (7) personalized benefits counseling (Bond, 2004).

The IPS program is  by far the most commonly evaluated Supported Employment program. Crowther et al., 2001, Bond et al., 2008, Heffernan et al., 2011, Larsen and Høgelund, 2014, Nøkleby et al. 2017 review the literature.

Burns et al., 2007 conduct randomized controlled trails in six European countries (UK, Germany, Italy, Switzerland, the Nederland, and Bulgaria). The idea is to test the employment effects of the IPS program in six different environments. 312 individuals with severe mental illnesses participated in the experiment. Participants were identified by IPS trained case workers to be motivated for regular employment. The treatment lasted for 18 months and each case worker had a maximum of 25 clients. The treatment as usual of the control group differ somewhat across countries, however the main difference between treatment as usual and the IPS treatment was that the treated group focused on direct and fast entry into regular employment while the control group had much more focus on preparing the individuals for future employment. Burns et al., 2007 find that the IPS program was more effective than treatment as usual in all six countries in terms of employment outcomes measured during the first 18 months after the start of the experiment. Individuals in the treatment group had worked significantly more hours, more days, had longer employment spells, and were more likely to have had any employment during the 18 months. 55

percent of the treated individuals had worked at least one hour during the period. For the control group this number was 28 percent. Burns et al., 2007 also find that the treated individuals had significantly less visits to the hospital and had less hours at the hospital.

Howard et al., 2010 study the effectiveness of the IPS program in London, UK using a randomized controlled trail for individuals with severe mental illnesses lasting for at least two years prior to the program entry. As in Burns et al., 2007 the treatment is to help the participants into regular employment as fast as possible and then continuously supporting the participant after entry. The control group received treatment as usual, which consisted of more traditional vocational rehabilitation and training where the goal was to prepare the individual for future employment. This included courses on how to write a CV and a job application, job interview preparation, and IT qualification. The evaluated outcome used in the study is employment where employment is measured as having worked for at least 30 days continuously in a regular job at a wage above or equal to the minimum wage. The study finds no significant effect of the IPS on the employment of the individuals.

Bejerholm et al., 2015 aim at determining the effectiveness of IPS in a Scandinavian setting. They perform a randomized controlled trail in the city of Malmö, Sweden. 120 participants are randomized to either IPS or traditional vocational rehabilitation. Traditional vocational rehabilitation in Sweden typically consists of prevocational training in sheltered settings. Participants were required to be of working age (18-62) and to have a psychosis or psychiatric diagnosis where the disability significantly impacted there every day functioning for at least two years prior to the treatment. They find that individuals receiving the IPS treatment had worked more hours, longer tenure and higher income after 18 months. Based on these results, Bejerholm et al., 2015 conclude that the IPS program is effective in a Swedish setting compared to traditional vocational rehabilitation in terms of employment outcomes.

## Assertive Community Treatment

The Assertive Community Treatment (ACT) is an interdisciplinary holistic approach. In this approach the current needs and goals of the participant form the basis of the treatment. A team of specialists conducts the treatment. The goal is that the teams cover all relations to the system, so the team becomes a single entry point for the individual. Such a team can include caseworkers, psychologists, psychiatrists, nurses, experts on drug abuse, as well as individuals with a focus on employment and education. The

costs of this type of intervention is potentially high as the number of participants per individual is low. Furthermore, the goal of this type of intervention is not necessarily for the participant to enter employment, as the goal is set by the participant and is constantly updated.

Bustillo et al., 2001 and Kirsh et al., 2007 review the evidence on the effectiveness of the ACT Program. Chandler et al., 2007, Chandler et al., 1999, Furlong et al., 2002; Jerrell, 1999; McFarlane et al., 2000, 1997, Resnick et al., 2003 find positive effects on employment of various versions of the ACT program. On the other hand Fekete et al., 1998 and Nieves, 2002 find no significant effects on employment. Furlong et al., 2002 show that adding an employment specialist to the team and including elements from the IPS program statistically improves the employment outcome of the participants.

## 6.2 Physical and chronical disabilities

### Workplace accommodation

Workplace accommodation consists of a broad set of initiative put in place to decrease the impact of the physical or chronical disability. These can include changes in work schedules and work organization, restructuring of work environment, acquirement of assistive technology, assistance of other persons, and changes in commuting to and from work, and it can focus on a single person or whole organization. Padkapayeva et al., 2017 review and discuss the different approaches and Smith et al., 2017 and Nevala et al., 2015 review the evidence of the effectiveness regarding employment.

The effectiveness of workplace accommodations is examined regarding employment, workability, and cost–benefit among persons with disabilities in the systematic review Nevala et al., 2015. The authors found that there was moderate evidence that specific types of workplace accommodations (vocational counseling and guidance, education and self-advocacy, help of others, changes in work schedules, work organization, and special transportation) promote employment among physically disabled individuals and reduce cost. However, they do not find much evidence supporting that workplace accommodations such as liaison, education, work aids, and work techniques coordinated by caseworkers, increased return to work and were cost-effective when compared with the usual care of persons with physical and cognitive disabilities. Hou et al., 2017 in a systematic review do no find evidence supporting that vocational rehabilitation is helpful in returning workers with upper limb injuries to work.

## Assistive technology and build environment

Assistive technology tools and devices are defined as any item, piece of equipment or product system, whether acquired commercially off the shelf, modified or customized, which can be to increase, maintain or improve functional capabilities of an individual with a disability (Sauer et al., 2010). Sauer et al., 2010 argue that there had been a trend during the last 25 to 30 years where the use of assistive technology has moved from low tech to high tech tools and devices.

The use of advanced technologies, such as visual and auditory curing systems, as assistive technologies specifically address cognition and as such has the potential to increase the participation rate among individuals with cognitive limitations. The evidence on the effect of an increased use of assistive technology for individuals with physical or chronical disabilities on their participation in the labor market is however scarce. Anttila et al., 2012 conclude in their systematic review that there is a current gap in assistive technology outcomes research, and that many frequently used devices have not been systematically reviewed. Smith et al, 2017 argue in their systematic review that there is moderate evidence supporting that assistive technology, especially apps for cueing and peer support can increase work participation for individuals with intellectual disabilities, neurological disabilities, and autism spectrum disorder.

In a systematic review Sauer et al., 2010 show that assistive technology interventions demonstrate positive outcomes on job performance for individuals with cognitive disabilities. These technologies mostly include visual and auditory tools and devises. The positive outcomes were measured as a higher rate of accuracy and task completion, increased independence, and generalization of skills.

Gentry et al., 2015 use a randomized controlled trial to determine the effect of the use of an Apple iPod Touch PDA as a vocational support tool for individuals with autism spectrum disorder. 50 individuals who were beginning a vocational placement supported by a job coach participated in the experiment. The treated group received training in the use of the PDA prior to starting their job and the control group received the training after 12 weeks of employment. The results show that receiving the PDA training prior to employment significantly reduced the necessary support hours provided by the job coach. Similar, Weaver, 2015 argue in a systematic review that video modeling, and visual work systems demonstrate potential for on-the-job independence among individuals with autism spectrum disorder.

# 7. Summary and comments

In general, the limited evidence available for this review restrict the reliability of the lessons that can be learned. Most of the evidence is based on difference-in-difference methods or quasi-experiments. Only a small amount of studies conducts randomized controlled experiments. Furthermore, the cost-effectiveness and cost-benefits of the policies are unclear.

There is little cross-country consensus on effectiveness of these policies. This can be due to the differences in institutional setting, differences in the targeted populations, and the quality of the evaluations. Conditional on these restrictions on the interpretations, many of these studies actually find positive returns to disability policies targeted employers.

The results on the incentivizing policies such as wage subsidies and supported employment are mostly positive. There is a serious lack of evidence of supported employment practices. Most of the studies focus on the IPS scheme of disabled individuals with mental health issues. The evidence suggests that this particular scheme has positive effects on the employment probability. The internal validity in these studies are in general high. However, as the studies are often based on very small sample sizes the external validity can be questioned. One of the main ingredients in IPS scheme is early intensified interventions. This is an ingredient, which is also proven effective in unemployment benefit schemes. I find modest evidence of workplace accommodations such as assistive technologies can increase the employability of physical and chronical disabled individuals.

The evaluations of the Swedish and the Danish wage subsidy schemes suggest large positive employment effects of these programs, when employment is measured as including both subsidized and unsubsidized employment. Studies on the Spanish hiring subsidy scheme were not able to find the same positive results. Furthermore, new field experiment on the Belgian and Swiss wage subsidy schemes do not find any positive effects when evaluation callback rates. One downside of incentivizing policies such as permanent wage subsidies is that they can be rater expensive and the size of potential substitution effect is still unknown.

Forceful policies such as employment quotas and experience rating of disability benefits seems to provide positive results on the labor market participation of disabled workers. The results from evaluations of anti-discrimination laws are less clear. The direct costs for the government of introducing these kinds of

forceful policies is limited and might even in some cases create a surplus, which can be used of other supportive practices. When implementing these policies one, however, has to carefully consider the potential consequences of restriction the flexibility of the labor market. These policies might have undesired side effects on the willingness of employers to hire disabled workers to regular positions as the costs of the programs are moved from the government to the employers. E.g. experience rating might create a reluctance to hire individuals who are expected to be in risk of disability and quota systems can cause a cap on the employment of disabled workers.

Hullegie and Koning, 2015 argues that the implemented experience rating reform in the Netherlands protected those who already had a job, but may have inadvertently reduced the hiring opportunities of people with a disability. Both quotas and experience rating are in risk of imposing stigmatization on the disabled workers as they might become unwanted at the workplace.

In general, we do not know much about the general equilibrium effects of neither the forceful nor the incentivizing policies.

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