# Closing the gap:

## The impact of labour market institutions on the employment rates of people with disabilities

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**Abstract**

Many developed nations are facing ageing populations due to an increase in life expectancy, and are seeking ways to maintain their workforces for longer to pay for the increased demands on the welfare state. However, as a population ages, the prevalence of disability increases as age and disability are highly correlated. If governments are to prepare their workforce for working longer, they must also increase the accessibility of the labour market for people with disabilities. This paper seeks to examine the effect of labour market institutions on people with disabilities compared to able-bodied individuals. This paper uses search theory and monopsonistic labour markets to explain the effect of institution, and tests how well this model is able to predict the effect of institutions. It uses the European Social Survey to calculate the disability employment rates of 19 nations in Europe, as there is little regular collection of data regarding disability employment rates across European nations. First a cross-country comparative survey examines the disability employment gaps across the 19 European nations, before conducting a micro-level analysis on the 188,029 individuals in the pooled European Social Survey dataset for the period 2002-2014. The results provide evidence that people with disabilities are impacted differently by labour market institutions, and that search theory and monopsonistic labour markets provide a good model for understanding why this may be the case.

## Contents

## I. Introduction

Developed nations across the world are facing the dual pressure of an ageing population and increasing fiscal expenditures on the welfare state. One cause cited by the Organisation for Economic Co-operation and Development (OECD) is that people today are living longer than previous generations, but older populations also result in higher prevalence of long-term illness and disability (OECD, 2010). The European Commission (2010) estimates that one-sixth of the European population lives with a disability and estimates that this group has a 70% higher chance of poverty partly due to poor employment opportunities. Wider than the European Union, the United Nations (UN) adopted the Convention on the Rights of Persons with Disabilities (CRPD) in 2006, and the OECD has published two reports on tackling the poor employment prospects for persons with disabilities since 2003. The OECD (2003) identified two key objectives of disability policy. The first seeks to prevent the exclusion of people with disabilities from any aspect of life, whether that be social or economic, and in particular to allow people with disabilities the opportunity to seek gainful employment. The second objective is a traditional welfare state goal of ensuring that those with disabilities have income security and are given the means to ensure they can live a decent life regardless of any restricted earning potential (OECD, 2003, p. 3). The OECD (2003) view of these goals as potentially contradictory underlines the prevailing orthodoxy of the time; that having a decent income that is not dependent on the state is out of reach for many individuals who have a disability. The reality of increasing numbers of individuals requiring income maintenance from the welfare state with a shrinking workforce able to support these payments is challenging this way of thinking.

The UN CRPD Article 27 recognises the right of an individual with disability to seek and gain employment in the labour market, and that governments have a duty to facilitate this. The OECD (2010) published a further report on best practice in increasing employment rates and removing economic barriers for people with disabilities. But there is variation across nations. Whilst the vast majority of nations ratified the UN CRPD, only roughly half signed the optional protocol that allows disabled citizens to complain to the UN Committee on the Rights of Persons with Disabilities about state-party violations to their rights. This could reflect a view of the non-signatories that existing human rights legislation adequately covers these areas, or that a nation does not want to face outside scrutiny for its actions. In the Netherlands, reasons for not signing have been cited as infringing on national sovereignty or claims that the Government's reforms would not be compliant with the additional requirements (Coalition for Inclusion, 2012). The Disability Federation of Ireland claimed that the Irish Government's reluctance to sign the optional protocol "seems to indicate extreme nervousness about the robustness of disability services" (Holland, 2018). Nations that haven't signed the optional protocol include other EU nations such as Norway, Poland, and the Czech Republic.

A common explanation of reduced employment rates for people with disabilities is that they have a lower marginal productivity of labour and cannot compete effectively in the labour market. Disability welfare schemes often use the measure of reduced work capacity to evaluate eligibility for benefits such as in Austria (see Staubli & Zweimüller, 2013) or the Netherlands (see Koning & Lindeboom, 2015), where workers are evaluated on how much their earnings potential has decreased. Often this measure is quantified, for example a 35% reduction in earnings capacity in the Netherlands qualifies for a partial disability award. Other systems such as the US use an evaluation as to whether the worker is unable to seek gainful employment, and therefore this more of a qualitative assessment (Autor & Duggan, 2006). But attempts to quantify an accurate reduction in productivity are highly troublesome, as there is a very large range of potential jobs that an individual can undertake and their impairment's constraints will vary by situation. In Austria, after 50 years of age the claimant's productivity is compared only to a job in their current industry, thereby simplifying the evaluation and leading to increased claimant rates (Staubli & Zweimüller, 2013). This may be because evaluating a person with disability's ability to work in all jobs would be highly impractical, but as the OECD (2003) stated the idea that disability prevents an individual working in any type of job is completely unfounded. While the fiscal costs may be high, the actual number of people with disabilities receiving DI benefits is a low proportion of the total disabled population. There will be a portion of significantly disabled workers that employment is not an option, but there is a far greater population of people with disabilities that do not fully exclude them from the labour market.

The impact of labour market institutions on employment rates has been a popular topic in previous economic analysis. Labour market institutions is used here to cover institutions such as unions, labour market policies such as active labour market policies, and labour market regulation such as employment protection legislation. Belot & van Ours (2004) showed that the interactions between labour market institutions (in this case unions, labour taxes, employment protection legislation, and unemployment benefits) could help explain the relative success of different OECD nations in tackling unemployment rates. This research has been replicated with findings that changes in labour market institutions can be linked to changes in unemployment levels (Nickell, Nunziata, & Wolfgang, 2005). But the literature has failed to fully examine the implications of these institutions on different groups of workers and whether the impact on employment rates varies between these groups. The assumption of homogeneity in workers allows for broad macro-based policy advice, but neglects the potentially more complex causal mechanisms at play.

This paper seeks to develop the public administration and economics literature by focusing on how individuals with disabilities are impacted differently by labour market institutions. It will answer the following research question:

*To what extent can labour market institutions and labour market policies explain the differences in employment rates for people with disabilities across developed countries?*

This analysis will advance public administration research by asking how individuals with disabilities are separately impacted by labour market policies. There has been significant analysis of the labour market for other segments of the population such as women and migrants, and the literature needs to broaden its focus to individuals with disabilities. As society ages, governments are seeking to raise retirement ages across many developed nations but if older workers are excluded from employment due to disability then these policies will have little effect. Previous economic literature as focused narrowly on disability insurance schemes ignores the much wider population of people with disabilities who may fall out of the labour market and not receive welfare payments. The existing literature will be examined in more detail in the literature review below, but this analysis will provide insight with both theoretical and practical policy implications.

This paper will also add to the economic literature through the testing of search theory and monopsonistic labour markets, applying insights from these models to hypothesise the effects of these institutions on people with disabilities. Neoclassical models of the labour market have come under criticism for struggling to explain empirically observed phenomena such as involuntary unemployment and why equal pay legislation has not lead to lower employment. While these discussions lack a widely agreed consensus, the need for more nuanced models can be appreciated. This paper incorporates a model of the labour market that is composed of search theory and the frictions in the labour market, and widens it to include the monopsonistic labour markets as theorised by economists such as Manning (1996; 2003). These theories are linked and provide a complimentary picture of the micro-level and macro-level labour market. This paper will use this framework to generate hypotheses and then test whether the model can explain any unexpected results. This model is compared to neoclassical economy theory, and allows for worker heterogeneity such as differences between individual's job search functions and their relative bargaining positions in the labour market. It is important that search theory and monopsonistic labour markets provide accurate predictions or plausible mechanisms for different groups in the labour market, such as the disabled, or the model will not provide much more insight than neoclassical theory.

The analysis will use the European Social Survey (ESS) to calculate the employment rates of individuals with disabilities as disability employment data is not regularly collected by national governments. This approach was inspired by Geiger, van der Wal, & Tøge (2017), and allows for disability employment rates to be calculated at two-year intervals. Eurostat and other European organisations frequently use data from the 2011 Labour Force Survey ad hoc module on disability to

calculate the disability employment gaps, but this only provides a one year snapshot. The ESS weights are calibrated using data from the Labour Force Survey, so this gives greater confidence in the accuracy of its results. Geiger, van der Wal, & Tøge (2017) used the ESS to track changes in the disability employment gap, but this paper will go further and seek to explain the variation in the employment rates with data from the OECD and EU to calculate institutional variables. The ESS is a social attitudes survey, so this approach may not seem intuitive, but it provides a unique new insight into how the labour market functions for different individuals.

The first section will discuss the literature on disability issues and set out the hypotheses to be tested. The second section will explain the theoretical model of the labour market used throughout the analysis. It will then set out the research method including dataset description and operationalisation of concepts. It will then present the results of the analysis and the final section will discuss these results and conclude.

**Literature review**

The following literature review examines the previous research into disability issues, and how the labour market participation may differ for people with disabilities compared to the able-bodied. Much of the previous public administration research on disability has focused on the rate of disability benefit recipiency and efforts to reduce this cost to the welfare state. The issue of labour force participation and disability benefit receipt are certainly linked – in almost all welfare systems, the receipt of such transfers is dependent on being unable to work. But it would be premature to take the inverse of benefit receipt and assume that this represents insight on labour force participation. First, the literature on disability insurance will be examined, representing the traditional area of focus for disability-specific issues. The overlap between medical and economic literature will be briefly examined relating to the ability for people with disabilities to work. Thirdly, the effect of antidiscrimination legislation will be explored, which is particularly focused on the Americans with Disabilities Act. Finally, the literature focused on maintaining employment for people with disabilities will be covered before drawing comparisons with the wider economic literature on employment. The insights from this review will be expanded upon and addressed in the theoretical model in the next section of this paper.

Disability rates have increased as a consequence of demographic change and longer lifespans in most developed nations, and this has created increasing pressures on the disability benefit systems. The Netherlands became a case of special interest as it's disability insurance scheme was described

as out of control by the OECD and enrolled a significant percentage of the labour force (Koning & Lindeboom, 2015). Koning (2005) found that experience rating firms had an impact on the rates of disability insurance (DI) inflow and outflow rates, but Koning & Lindeboom (2015) suggested that along with the reduction in DI inflow disabled workers were moved onto temporary contracts that were not subject to welfare liabilities. This highlights the difficulty in using a reduction in DI recipiency as a proxy for an improvement in the ability for people with disabilities to gain employment in the labour market. Furthermore, it shows that there may be additional barriers to employment for people with disabilities outside of any incentive effects present by benefit transfers.

The effect of DI on reservation wages has been a popular topic, and consequently whether decreasing benefit generosity is a viable approach to increasing labour force participation. Gruber (2000) found in Canada that policy change between provinces implied an elasticity of labour force nonparticipation with respect to DI of 0.28–0.36. Supporting this analysis, research on Austria found that a 1% increase in potential DI benefits was associated with a 1.2 per cent increase in DI claiming (Mullen & Staubli, 2016). There have been many research papers on DI receipt in the USA, broadly with a consensus that increased benefit generosity induces people with disabilities to leave the labour force and claim DI instead (Autor & Duggan, 2006; Benitez-Silva & Heiland, 2008; Burkhauser & Daly, 2011). This can be attributed to the non-work requirements of the benefits; individuals can only receive them if they are unable to work and when the generosity increases then there is a strong substitution effect towards non-employment. However, in schemes where there are no employment-related conditions regarding benefit receipt, a decline in employment is still witnessed (Boyle & Lahey, 2010). This implies that there is a strong income effect regarding DI receipt, and that even if work-related conditions were withdrawn then the non-participation in the labour market would still prevail (Silva & Vall-Castello, 2012). An explanation of the persistent non-participation response to DI is that the lower participation rates are disabled individuals revealed preferences for leisure over additional consumption. This provides two insights for labour market models for people with disabilities; firstly that there are incentive effects linked to DI receipt, and secondly there are other factors impacting participation decisions which might reflect preferences or another variable.

There has been some crossover between medical and economic literature examining the value of employment itself for individuals with disabilities. Evidence supports the intuitive view that people with disabilities can and want to work (Backman, 2004; Mowbray, Bybee, Harris, & McCrohan, 1995; Kirsh, et al., 2009). Employment has been found to benefit individuals both with their physical and mental health (Kirsh, et al., 2009). Employment therefore should be seen not only as a way to relieve financial pressures but also as a treatment to improve health outcomes in the population. There also appear to be spillover effects outside of employment to healthcare and across

generational divides. Dahl & Gielen (2018) found that moving disabled parents from disability insurance receipt into employment boosts the employment prospects of their children. The literature in this area supports policy goals to increase the employment of individuals with disabilities has benefits to the individual and society wider than just the affordability of welfare systems. But more than just the public administration implications, this research shows that employment itself is not a burden on people with disabilities but also has an intrinsic benefit. This could imply that it is certain barriers to employment lowering participation rather than preferences alone.

Legislation has been enacted across developed nations to ensure that disabled workers are not restricted from employment, most commonly by requiring employers to make reasonable accommodations (or also called adaptations) to reduce these barriers. The Americans with Disabilities Act of 1990 was one of the first pieces of antidiscrimination and reasonable accommodations legislation, and imposed a duty to provide accommodations on all firms above 25 employees in size. Contrary to the Act's intention, evaluations of its effect indicate that employment rates of people with disabilities fell after the measures came into effect (Acemoglu & Angrist, 2001; DeLeire, 2000). More recent research has shown that workers who are given reasonable accommodations by their employer are more likely to remain employed and for longer (Anand & Sevak, 2017; Campolieti, 2005). The ADA clause that places the regulations on firms larger than 25 employees created an effect in only the middle-sized firms, with the fall in employment not found in small and large companies (Acemoglu & Angrist, 2001). This implies that there may be significant threshold effects, or that company size is important in absorbing these costs. Many countries in Europe apply the legislation to all firms, regardless of size. But perhaps more importantly, all countries in Europe provide government funds to cover "unreasonable" costs, with the definition of what this includes also varying by country. The debate over the effects of antidiscrimination legislation will be explored in more depth in the theoretical framework, but the model must be able to explain the different empirical observations of both the ADA literature and more recent research.

There has been a number of studies into how remaining with the same employer boosts the longer-term employment prospects for a worker as they become newly disabled or sick. Campolieti (2004) found that workers who had received training from their employer and returned to that same employer post-injury were more likely to receive an accommodation. Høgelund & Holm (2014) reinforced this finding, with longer employment durations for workers that returned to the same firm after a period of illness, and employment duration was increased further by accommodations. The provision of accommodations by employers appears to be as important in influencing labour market participation decisions as the DI replacement rate (Burkhauser, Butler, & Kim, 1995). Job heterogeneity appears to be increasingly important to workers with disabilities, as their propensity to

remain in the labour market is highly dependent on whether they remain with the same employer or seek a new job. The neoclassical model has some of its appeal in its simplicity, but this empirical finding appears to be contrary to expectations. The model in this paper seeks to incorporate the result that a worker faces the highest propensity to maintain employment if they remain at their current employer.

This brief summary of the disability-related literature has only sought to cover the topics most relevant for the study of employment rates of people with disabilities, and how this is relevant for a model of the labour market. It is also brief due to the relative lack of interest in the area in economics-focused studies, which have been mainly concerned with disability welfare programmes and their effect on employment of participants. As mentioned earlier in the introduction, there has been wide economic interest on the effect of labour market institutions and employment rates, but the labour force considered in aggregate. Belot & van Ours (2004) examined the different frameworks of labour market institutions that led to countries in the OECD reducing their unemployment rates. Nickell, Nunziata & Wolfgang (2005) use similar mechanisms to explain changes in unemployment since the 1960s, and Nickell (1997) found the difference in employment rates between the US and Europe could be explained by labour market rigidities. These papers, along with the many others examining labour markets, highlighted the importance in labour market institutions in determining the employment rates within an economy. What has been lacking is a focus on how the effect of these institutions can vary by group, and the model of this paper will seek account for different groups in the same labour market. This paper will seek to adapt these approaches to the disability-specific context and see whether the same conclusions hold.

**Hypotheses**

The following section will draw out specific hypotheses about people with disabilities that this paper's analyses will seek to test. The reasoning for these hypotheses will be set out in the theoretical model in the following section, and are based upon a model of search theory and monopsonistic power in the labour market. The variables examined are inspired by the previous economic studies highlighted in the literature review, which examined the importance of labour market institutions as well as the interactions between these institutions.

*Hypothesis 1: Higher levels of excess coverage in unions will lead to negative outcomes for outsiders, which includes people with disabilities, and therefore increase the disability employment gap.*

Unions seek to protect and enhance the position of their members within the labour market, and this can be at the expense of other workers. Individuals with disabilities are less likely to be in employment with permanent contracts, and therefore are less represented in unions and the decision-making process. This reduces the efficiency of the labour market, and reduces access to employment opportunities. In countries with extension laws, the greater the mismatch between the membership and the wider population, the stronger the externality will be on individuals with disabilities

*Hypothesis 2: Employment protection legislation imposes extra costs to hiring and firing and therefore lead to lower employment, and this effect will impact individuals with disabilities more strongly.*

Employment protection legislation seeks to provide workers with greater rights and powers in employment, but it slows down the job matching process as firms become slower to dispose of unproductive labour and more hesitant to hire new workers. Individuals with disabilities face greater concerns and uncertainty over their productivity, and so employers will be even more hesitant to hire such individuals. This will lead to lower employment rates for individuals with disabilities. This argument is similar to hypothesis 1, but there is a different mechanism. Unions prioritise the interest of their members and therefore neglect the needs of people with disabilities, whilst employment protection regulation provides a specific barrier to employment that is harder for people with disabilities to overcome.

*Hypothesis 3: A greater focus on Active Labour Market Policies will lead to more efficient job matching, and therefore lead to smaller employment gaps between able-bodied and disabled workers.*

Active Labour Market Policies (ALMPs) seek to increase efficiency at the micro-level by incentivising job search intensity and increasing human capital, and at the macro-level this leads to faster matching. All countries have some level of activation policies in the labour market, but they differ in the choice to focus on either active or passive policies. Countries that direct more resources to activation policies will increase their labour market matching and therefore disability employment rates. This can be due to the overrepresentation of people with disabilities in the unemployment pool, but also from reducing the productivity gap and difference in search frictions between able-bodied and disabled individuals.

*Hypothesis 4: Higher generosity of benefits will lower employment rates unless accompanied by high activation spending.*

The literature has a consensus that higher generosity of transfers leads to lower labour participation, whether that be due to substitution or income effects. Individuals receiving these benefits will have

a higher reservation wage, and due to a higher income level, they will demand more leisure. Given that disability benefits are only available to individuals with disability, this will only influence this group and therefore lower their relative employment rate.

*Hypothesis 5: Antidiscrimination legislation will lead to increased participation in the labour force, and to a greater extent if done comprehensively.*

Antidiscrimination legislation has had mixed results, with the impact in the USA found to be akin to greater EPL for disabled workers but on the individual level employers making accommodations for disabled workers increasing durations of employment. The hypothesised problem with the ADA and its negative impact on employment is the lack of consistency in the application of the regulations. The spillover effects of investing in people with disabilities can increase accessibility of workplaces to the wider population as well as impacts over generations. Another hypothesised mechanism is that employers exploit lower wage elasticities of disabled workers, lowering their wages and therefore employment. Antidiscrimination legislation will counter this wage discrimination, and therefore raise employment levels. A more rigorous application of antidiscrimination legislation and commitment to reducing barriers is expected to lead to greater investment in people with disabilities, and greater employment outcomes.

*Hypothesis 6: Sheltered employment is expected to lead to lower disability employment rates as participants are not prepared for the wider labour force and programmes crowd out resources for more effective ALMPs.*

Public employment is attractive to governments for its ability to have a direct impact on unemployment and completely in government control to deliver. However, evidence shows that such schemes are costly and have very low outflow rates. Countries that continue to use such schemes can be expected to do so for political reasons, but economically they are inefficient. But these schemes have a wider impact on the economy. This mechanism has an impact both through the resources wasted (as more individuals could have been supported for the same resources) and through an implicit discouragement for people with disabilities to integrate into the wider labour force. Sheltered employment does have a positive effect, as it directly creates employment, but this is far outweighed by the negative effects in aggregate.

## II. Theoretical model

### Neoclassical model of the labour market

The neoclassical model of the labour market considers it equivalent to other goods markets; supply and demand interact to decide a certain quantity of labour that is supplied at a given price, the wage. The model has three key assumptions that underline the theory:

1. Individuals act rationally that determines their preferences between outcomes.
2. Individuals seek to maximise their utility and firms seek to maximise profits.
3. Individuals have full access to relevant information and act independently on this basis.

These assumptions are used to create models for specific markets or phenomena, and underline many microeconomic theories. These assumptions are not uncontroversial, but it is worth examining under what conditions employment gaps could arise under the neoclassical model. Under the neoclassical model, labour is supplied according to individual worker preferences and demanded according to worker productivity, meaning employment gaps can arise from either side of this market. If the disutility of working for disabled individuals is higher, such as through work being more onerous, then they will choose to provide less labour to the market. Observations of disabled workers not choosing to work even when non-participation conditions are removed from their disability welfare recipiency would be evidence of this hypothesis (see Silva & Vall-Castello, 2012). Alternatively, individuals with disabilities could be held to have lower marginal productivities of labour, and therefore firms would be rational to demand less disabled labour or demand it at a lower price. Given the reduction in demand and fewer jobs open to individuals with disabilities (due to their lower productivity), this will reduce the employment rates of individuals with disabilities compared to their able-bodied colleagues.

The two phenomena that the neoclassical model is unable to explain are unemployment and discrimination within the labour market. Under the neoclassical model, there is no involuntary unemployment as all individuals choose to work the number of hours until their marginal rate of substitution between consumption and leisure is equal. Furthermore, the wage reflects the marginal productivity of labour so there are no excess wages that would induce an oversupply of labour. There may be one situation where there are individuals willing to work for the market wage and unable to secure work. Since currency has discrete values, there will be a number of individuals willing to work at each wage level. Therefore, for the final marginal increase in market wage, there may be a number of individuals willing to work, but only one job. However, this doesn't represent "true" involuntary unemployment; at this wage the individuals are indifferent between working and leisure,

therefore their welfare is not harmed and they will be just as content with not working (Boeri & van Ours, 2013, p. 30). However, involuntary unemployment is observed empirically. There are two (non-exclusive) reasons that the model's conclusions do not hold. Firstly, the assumptions that underline neoclassical thinking may not hold, nor may the assumption that the labour market is perfectly competitive. Secondly, governments may have intervened in the labour market to create institutions or regulations that distort the market. These will be examined in turn in the following sections.

Discrimination can represent total exclusion of certain groups from the market or discriminatory pay practices whereby wages are not reflective of the marginal productivity of labour. Theoretically these can both be described through one model of wage discrimination, as full exclusion is effectively a wage below the level the worker is willing to work for (or even a wage of zero) and therefore no labour is supplied. Discrimination in wages can reflect firms responding to non-wage preferences of workers or it can reflect discrimination against certain segments of the population based on characteristics unrelated to their productivity or preferences. The former form of discrimination will be discussed later. Suppose a situation where there are two firms producing the same good and there are two groups of workers, men and women, who have the same productivity. The first firm does not hire women, and so wages for women fall in response to the lower demand. But the second firm does not restrict employment to women, and the lower price of labour means it undercuts the first firm on production costs and therefore price. It is not sustainable for a firm unilaterally to discriminate against hiring certain sections of the workforce, as the costs of discriminations mean consumers will switch to lower priced products (Mankiw, 2012, p. 407). However, as this suggests, should consumers have preferences outside of prices alone, such as for products produced by segregated firms, then the higher prices may be sustainable. Only when discrimination is backed by consumers or by Government regulation (thereby raising costs for all firms) can it be a sustainable policy for firms (Mankiw, 2012, p. 408).

Discrimination may not be sustainable as a firm-driven policy, but social discrimination can lead to disparities in workers that have the same effect on reducing economic opportunity. The model of discrimination above assumed that labour productivity was equal among groups, but this assumption may not be met in reality. Mankiw (2012) described how wage and employment differences reflect to a large part the opportunities for investment in human capital across groups. This can involve a greater opportunity to go to university, or higher investment in neighbourhoods that consist of certain demographic groups. The firm can hire the best person for the job, but society can limit the potential of individuals and ensure only certain groups can be the best person for the

job. While competition is the antidote to discrimination in economic terms (to use Mankiw's phrase), social policy can help or hinder certain demographic groups due to human capital investment.

**Search theory and frictional unemployment**

Search theory relaxes assumption 3 of the neoclassical model and it is no longer assumed that buyers and sellers know all relevant information in the market, and therefore cannot find someone to trade with instantly. In the labour market, workers do not know all the jobs available in the market and must search themselves for employment opportunities. This creates frictions, as not only is there an element of uncertainty but there is also a time delay in finding and securing a mutually beneficial deal. This section sets out a model for how these frictions can cause unemployment in the labour market, and impact individuals with disabilities to a greater degree.

An individual receives job offers at a constant rate, with a random distribution of wages around a mean. The worker can choose to accept or reject these job offers, thereby either moving into the labour force or remaining in non-participation respectively. The decision function for the worker in this situation is whether the wage offer is higher than their reservation wage.

$$(1)\ accept\ if\ w^* > w_r$$

The worker's reservation wage relates to their standard utility function, where H is the number of hours of leisure and γ is non-wage income.

$$(2)\ w_r = U(H + \gamma)$$

The decision to accept must make the individual worker better off than not working, and let β be the number of hours worked at a given job and *wL* be the wage income of the individual.

$$(3)\ wL + (1 - \beta)H + \gamma > H + \gamma$$
$$(4)\ wL - \beta H > 0$$

Equation 4 shows that if the additional consumption a worker gets from employment is greater than the value they place on those hours of leisure, then they will accept the job. This is referred to as a reservation wage strategy.

The value of $\beta$ can provide an additional friction to the job search process if, like many jobs, the hours are fixed. Fixed hours prevent workers from maximising their utility and choosing the optimal number of hours of work, leading to the situation represented in Figure 1. In Figure 1.1, the

*Figure 1: The employment friction of fixed-hours job offers*

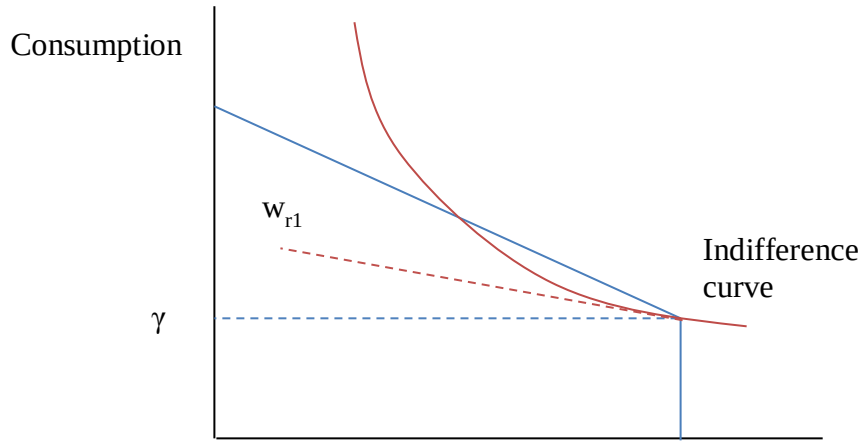



*Figure 1.1: if the individual can freely choose the number of hours to work, they will be on reservation wage curve* $w_{r1}$

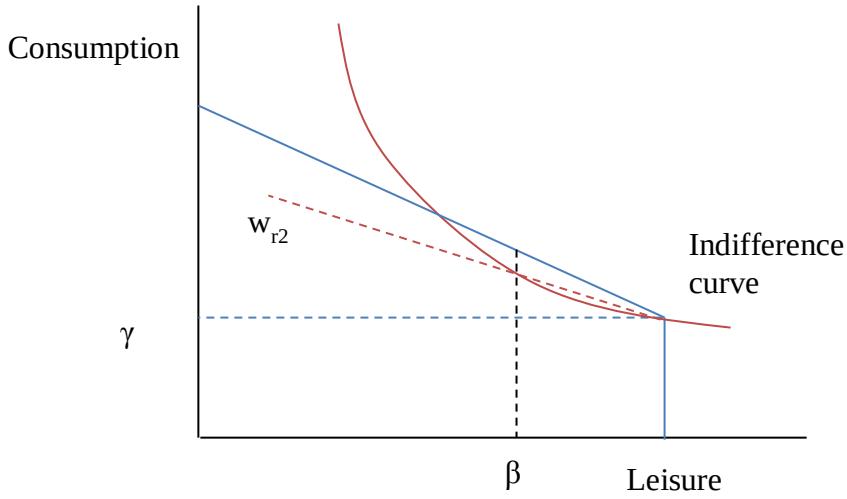



*Figure 1.2: when the number of hours is fixed at β, then the individual's reservation wage rises from* $w_{r1}$ to $w_{r2}$

worker will accept any job above the reservation wage curve, as it will be above their indifference curve from not working. However, if the number of ours is fixed at β*, then a higher reservation wage is required since this is the lowest point that the reservation wage curve can intersect with the indifference curve at β* and beyond (Boeri & van Ours, 2013, p. 9).

The value of β can provide a friction disproportionately impactful on disabled individuals. Whilst fixed hours provide a constraint on the preferences of all workers, for disabled individuals they may be restricted in the number of hours they can work for medical reasons. Someone with a fluctuating condition, such as rheumatoid arthritis, have 'flare ups' that can reduce their working capacity for a number of hours, days, or weeks. Working a 10-hour shift may not be possible for someone who due to their condition can only stand and walk for about 5 hours a day. These additional personal constraints can make fixed hours or job conditions far more binding for disabled workers than able-bodied workers, and therefore lead to greater employment gaps. This can also hold in the

neoclassical model, but would be depicted as an individual preferring leisure rather than taking these jobs with fixed-hours constraints.

An individual's job offer rate can vary due to heterogeneity among the labour force. The search model depicted above described the offer function as having a constant arrival rate with wage offers randomly distributed around a mean. But both the job offer rate and the distribution can vary significantly, such as by the geographical location of the person or the type of job that an individual is suitable for. If a worker is restricted in the number of jobs that they can productively fill, such as an individual with disability, then they will receive fewer job offers than an alternative worker. An increased level of friction for the individual in the labour market prolongs their spell in unemployment. A second factor is the distribution of wages being offered to the individual. In an imperfect market without perfect information, a worker may be unaware of the distribution of wages and therefore it is harder to generate an expectation function regarding wages and the benefit waiting for further job offers. This is exacerbated when a person overestimates their own wage offer distribution, such as a worker who is not as productive as they believe. Secondly, they may wait far longer to get more information and certainty about their job offer distribution given that their job offer rate is slower. This can prolong their labour search in an inefficient manner. The reduced job offer rate and greater uncertainty over the distribution of job offers are two plausible explanations for greater disability unemployment from the search theory model.

The time taken to find a new job explains why there is not instant clearing in the market, but this does not explain why there is persistent unemployment. The labour market does not seem to be a neoclassical competitive market on a time lag. There is a cost to searching implied by the time taken to search, but this can be broader than just time spent. The introduction of costs to a search provides an improved explanation to why this lack of perfect information results in non-trivial frictions in the labour market. Mortensen & Pissarides (1994) used the cost in finding a new worker to explain why firms do not react instantly to changes in worker productivity, as the productivity gain from seeking a new worker must be greater than the cost of initiating a search for a new employee. The tolerance of minor inefficiencies in a firm can lead to significant allocative inefficiencies when considered in aggregate. Mortensen & Pissarides (1994) used this to explain "labour hoarding" by firms in response to an uncertain future potential gain at the expense of a certain known cost of searching for new workers. The insight of cost-to-firm from job search is relevant for the later discussion regarding labour market institutions, and in particular employment protection regulation. Search theories provide a key link in understanding why the market cannot clear efficiently due to frictions, but Pissarides (2000) went further and theorised that, unlike in the neoclassical model, all workers face a surplus from working. In this situation, the marginal product of labour is greater than

the reservation wage and the wage delimits how much of this surplus the firm gets and how much the worker receives. For the neoclassical firm, the marginal product of labour equals the wage which equals the reservation wage. This implies that firms can exert a level of market power in the labour market, and this leads to further distortions that will be examined later.

The length of the job search is a relevant factor in considering labour market participation due to discouragement effects that can push individuals into non-participation in the labour market. Discouragement theory holds that searching involves a cost for the individual which is paid at the start of each round of job searching and can be avoided if they choose to not participate in the labour market. This builds upon the cost-to-search insight from Mortensen & Pissarides (1994) but applies it not just to the firm searching for a new employee, but also to the employee searching for a new job. Rosholm & Toomet (2005) depict this cost as psychological, where the individual loses hope over repeated searches for suitable jobs and over time they prefer to not participate in the labour force. In their model, increasing the average length of the search period required to find a suitable job results in a lower employment rate for that group of individuals. Put another way, if an individual can be expected to search for a job for 6 months after which they no longer search, then groups that have a lower job offer arrival rate will be more likely to drop out of the labour force entirely. Furthermore, disabled individuals may suffer stronger discouragement costs – there is a psychological difference between there was a better candidate than them on the day and being told that they aren't the right sort of person to fill the job due to their disability. Therefore, the discouragement effect that limits search durations is an important consideration when examining labour force participation rates for disabled workers.

Search theory provides many plausible mechanisms as to why there are empirically observed differences between disabled and able-bodied individuals. Contract constraints regarding shift lengths and the minimum number of hours a week can exclude those who face personal constraints from their condition. Differences in job offer rate and uncertainty over the wage distribution can slow the process of accepting a new position. Search costs facing the firm can lead to allocative inefficiency which results to non-trivial effects in the macroeconomy. The search costs for an individual can lead to discouragement that is especially relevant for disabled workers and pushes them into non-participation more easily than able-bodied individuals. These mechanisms all can contribute to the persistent empirical employment gaps and ways for these gaps to be reduced[1].

[1] When search theory is considered in aggregate, this leads to matching models such as the Diamond-Mortensen-Pissarides model. A detailed summary does not add much to discussions of disability employment, but it adds the insight that as well as the flow of individuals in and out of employment, the stock of unemployed workers is also relevant in determining the average spell of unemployment. With more vacancies to job seekers, the quicker job search

**Monopsonistic labour markets**

The neoclassical model provides a baseline for analysing monopsony power in labour markets, and represents a situation where a single buyer of labour can exercise complete market power. If capital is held constant, and other elements in the production function represented as functions of labour then the firm faces the following decision where *Y(L)* represents revenue and *W(L)* the supply of labour as a function of wage:

$$(5)\ \max Y(L) - W(L).L$$
$$(6)\ 0 = Y'(L) - W'(L).L - W(L)$$
$$(7)\ Y'(L) = W'(L).L + W(L)$$

Equation 7 gives us the point at which profit is maximised; when marginal revenue (*Y'(L)*) is equal to the marginal cost of labour. It also shows that marginal cost is higher than the labour supply curve, leading to a firm demanding below the equilibrium quantity of labour and at below the equilibrium price. The firm can sustain this price level as it is no longer a price-taker from the market, and can gain supernormal profits from the exchange.

Monopsonistic labour market theory holds that all firms have some degree of monopsony power that firms exercise to create surplus rents. Manning (2003) first set out an explicit model of monopsonistic models, but acknowledges that the concept of firms having market power with respect to labour was an implicit assumption in many theories such as with Mortensen & Pissarides (1994). Manning's (2003) observation was that contrary to the prediction of a neoclassical, competitive labour market, if a firm was to marginally lower their wage then it would not immediately lose all of its workers. This result implies that the labour supply curve faced by any firm is not perfectly elastic, and that in line with Equation 7, an upward sloping marginal cost curve can be derived. Any profit maximising firm will use their market power and set wages, rather than the price mechanism exogenously determining wages in the market.

Monopsonistic labour markets do not represent a break with the neoclassical model per se, but a recognition of the observation that even in a market with many buyers and sellers of labour that there is not a perfectly competitive outcome. Firms are able to exert a degree of market power and this is a result of the aforementioned frictions from imperfect markets. Further underlining this observation is that, like monopolistic competition in goods markets, participants in the labour market are heterogeneous. The wage elasticity of workers is important in determining their behaviour in

is, but still subject to the same frictions described in search theory. This creates the Beveridge Curve, of which there may be many different Beveridge curves – one for able-bodied workers, and one for disabled workers. The latter curve would be further out from the origin point, and hence the employment gap.

response to heterogeneous job offers, and whether firms can exploit different wage elasticities. Previous labour market research has sought to explain why there are wage differentials for different segments of the population, such as between men and women. Webber (2016) focused on the gender pay gap between firms, finding that wage elasticity resulted in 3.3% of the pay gap between genders. Ransom & Lambson (2011) found that the gender pay gap for teachers in Missouri reflected women's preferences outside wages led to them becoming concentrated in lower paid districts even when there was equal pay at the level of the school. Finally, Birsch & Jahn (2015) found that differences in wage elasticities from unobserved worker heterogeneity explained almost the entire wage differential between natives and immigrants. This can reflect different compensation differentials, which is the non-wage characteristics of a job that an individual will consider before accepting a job offer. Individual's preferences over these perks or hazards to a job will determine a job-specific reservation wage and whether an individual needs higher or lower wages to convince them to accept the offer. Unlike the conclusion from the neoclassical model, the market power of firms in monopsonistic competition allows firms to be able to discriminate between groups and exploit the difference in wage elasticities.

Discrimination in wage setting can lead to lower employment outcomes than under perfect competition, implying that equality legislation can boost wages and not lead to the employment losses expected by neoclassical economic theory. Given that firms are able to wage discriminate, they will profit maximise and therefore set their demand for labour where marginal productivity of labour equals marginal cost of labour. With an upward sloping marginal cost curve (due to the firm facing an upward sloping labour supply curve), the firm will choose a wage and therefore quantity of labour below the competitive level. This explains the result that the Equal Pay Act raised the wages of women but was not accompanied by a fall in female employment levels (Manning, 1996). More generally, this mechanism explains the common question of why minimum wages are broadly not found to increase employment in empirical studies, but this is a contentious point. The relevance to disability is that it is covered under antidiscrimination legislation, and that such legislation can cause a cost to businesses. Under the neoclassical model this would lower the employment level of individuals with disabilities. However, should the employment level of individuals with disabilities be below the competitive level due to monopsonistic power and different wage elasticities, then antidiscrimination legislation can boost the employment of these individuals despite incurring extra costs for businesses. A further relevance for individuals with disability is their relative bargaining power compared to able-bodied individuals. The mechanism is similar as with wage elasticities, but has a different cause. Since individuals with disabilities have fewer job offers and roles they can fill, firms with market power can exploit this weaker market position and force wages down for these

workers. The lower wages result in lower employment. There is a range of ways that labour market institutions can be relevant to this weakened bargaining position, but for now it is enough to set out a further mechanism of market power depressing employment levels of individuals with disabilities. With a model of monopsonistic competition, extra regulation can reduce wage discrimination, affect bargaining positions, and increase the employment of individuals with disabilities.

**The effect of labour market institutions**

Labour market institutions are regulations and organisations that interact with the labour market as a result of the political process. They consist of attempts to correct for certain outcomes of the market that are deemed to be socially unacceptable or represent market failure. The institutions that will be examined in this paper are labour unions, employment protection legislation, disability benefits (with reference to unemployment benefits), active labour market policies, and antidiscrimination legislation. There are further institutions that impact on the labour market, but this paper is concerned with employment participation differentials of which the above institutions are likely to be most relevant. The institutions will be analysed through the model of search theory frictions and monopsonistic power in labour markets, and how these institutions can impact individuals with disabilities.

Labour unions are one of the oldest labour market institutions and represent workers' collective bargaining power to improve their working conditions and wages. Unions also have the power to negotiate deals on behalf of workers who aren't members, and the number of workers covered by the deals represents the union's influence. Table 1 details recent trends in union density and coverage. When you subtract union density from the deal coverage, the measure of a nations' excess coverage is gained, where higher levels indicate unions with influence far beyond their membership. Rueda (2005) theorised that the insider-outsider split, where those in secure permanent employment are insiders and those without are outsiders, can lead to the interests of outsiders being neglected in order to preserve the benefits of the insiders. Unions, thought of as organisations formed of insiders, could be held to represent and advance the interests of the insiders. Considering disabled workers are less likely to be employed, or have shorter employment spells due to their disability, they are likely to be overrepresented in the outsider group. This could leave the interests of individuals with disabilities neglected by unions and the deals agreed potentially hurting their employment rates. The hypothesised mechanism is through a reduced job offer rate, as unions reduce the ability for companies to efficiently adapt their labour force to changing business needs. This creates an extra cost to firing, and more labour hoarding. Excess coverage, where this split is exacerbated by

*Table 1: Union density, deal coverage, and excess coverage for 2008.*

| | Union density | Deal coverage | Excess coverage |
|---|---|---|---|
| Austria | 29.6% | 98.0% | 68.4% |
| Belgium | 54.5% | 96.0% | 41.5% |
| Czech Republic | 17.4% | 49.6% | 32.2% |
| Denmark | 66.3% | 81.5% | 15.2% |
| Estonia | 7.0% | 24.5% | 17.5% |
| Finland | 69.5% | 87.5% | 18.0% |
| France | 7.8% | 98.0% | 90.2% |
| Germany | 19.0% | 61.4% | 42.4% |
| Hungary | 14.4% | 26.0% | 11.6% |
| Ireland | 31.4% | 40.8% | 9.4% |
| Netherlands | 19.3% | 78.6% | 59.3% |
| Norway | 52.5% | 68.0% | 15.5% |
| Poland | 15.1% | 15.6% | 0.5% |
| Portugal | 20.7% | 85.9% | 65.2% |
| Slovenia | 26.6% | 92.0% | 65.4% |
| Spain | 17.1% | 78.9% | 61.8% |
| Sweden | 68.8% | 91.0% | 22.2% |
| Switzerland | 17.5% | 44.7% | 27.2% |
| United Kingdom | 27.0% | 33.6% | 6.6% |

*Source: OECD Statistics*

extension laws, is expected to drive an increasing wedge between individuals with disabilities and employment under this theory.

Employment protection legislation (EPL) consists of regulations that are concerned with the dismissal of redundant workers in the labour force, and what firms must do in these circumstances. EPL has many characteristics and variations, but can be reduced to a cost on the employer of terminating employment (Boeri & van Ours, 2013). As noted earlier, Mortensen & Pissarides (1994) explained that firms would retain workers until their productivity falls past a certain threshold to justify the search cost of finding a new worker. Should this cost increase, then the ability for firms to adjust their workforces to the optimal level is restricted, and labour hoarding increases. For the insider, this strengthens their position and the interests of insiders in a similar mechanism to unions. For the unemployed individual, the higher cost for the firm slows the churn in the workforce and

*Figure 2: The non-participation effect of conditional welfare transfers*

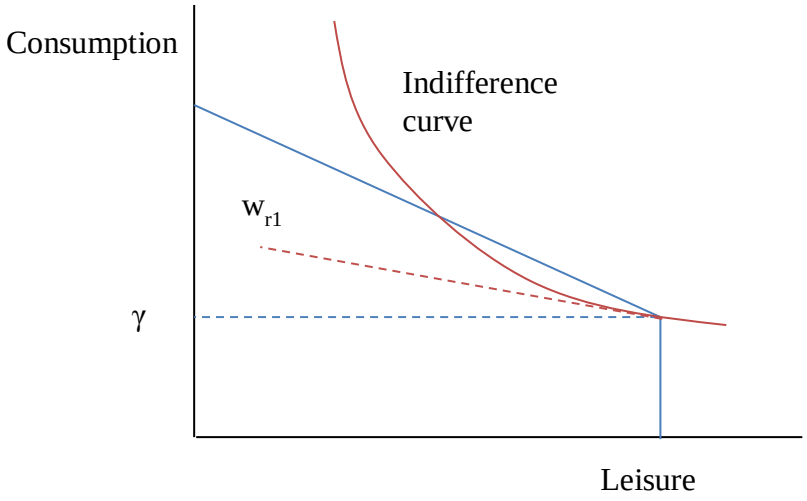



*Figure 2.1: the regular model of the individual decision to participate in the market given the market wage providing the budget line. Following the indifference curve, any wage above $w_{r1}$ will be accepted.*

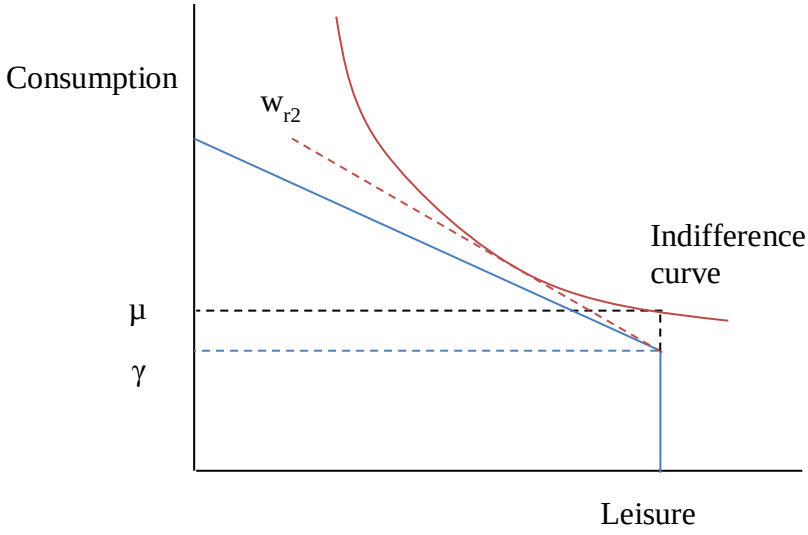



*Figure 2.2: the introduction of an additional benefit, μ, which is conditional on not working, moves the indifference curve upwards and creates a kink in the budget curve. Given the indifference curve from not working, the reservation wage, $w_{r2}$, is higher than the market wage.*

reduces the number of job offers per period as job creation is slowed. Therefore, while EPL applies equally to all workers, workers with disabilities already have a lower job offer rate and are disproportionately outsiders. This mechanism is similar to the union mechanism, as both make the labour market more rigid, but EPL applies for all workers whilst unions have a negative impact on outsiders. EPL represents an additional hurdle that further pushes them to their discouragement limit and the cessation of their job search activities.

Disability and unemployment benefits represent an increase in income (usually) conditional on the individual not participating in the employment. There are two key effects from these transfers; participation effects and taxation effects (Boeri & van Ours, 2013, p. 314). The taxation effect, simply the taxes required to pay for benefits, can be assumed to be universal as taxes apply to all workers and have an effect on depressing aggregate labour supply. The participation effect relates to the

impact on the reservation wage of individuals, and this varies by population segment due to eligibility. Therefore, it is worth focusing on how non-employment conditional benefits affect the individual's participation decision. Figure 2 shows how an increase in income conditional on unemployment can lead to an individual choosing to not participate in the labour market at the market wage. Since the benefit is conditional, it creates a kink in the budget line. The indifference curve of not participating is shifted up to the peak of the kink, and therefore results in a reservation wage that is too high to be sustained by the market. The participation effect's impact on disabled individuals can be broken down into two mechanisms. Firstly, since disabled workers can have lower productivities than able-bodied workers, then the generosity of the transfer could in aggregate lead to non-participation by this group. This is because the income from the transfers being higher than the wage an individual could get from the market. A second mechanism is the effect of the reservation wage on job search dynamics. The intensity of the job search is determined by the expectations of the payoff from seeking employment, and the cost of not finding a job (Boeri & van Ours, 2013, p. 318). If two groups have different reservation wages due to unemployment income but ceteris paribus, then the individuals with the higher reservation wage will stay unemployed for longer as the intensity of search is lower. Taken at the aggregate level, the group with a higher reservation wage could have lower employment rates. Therefore, income transfers dependent on unemployment can lower employment rates through both absolute and relative generosity of transfers.

Active Labour Market Policies (ALMPs) seek to lower unemployment by improving how the labour market functions, specifically through increasing labour mobility and investing in workers. In general, ALMPs are expected to increase the efficiency of the matching process and therefore increase employment levels. This causes the Beveridge curve of disabled and able- bodied individuals to converge to the origin point, therefore closing the disability employment gap. Individuals with disabilities also have specific labour market policies targeted towards their needs and capabilities, such as the practices of sheltered and supported employment. Sheltered employment has been popular in past decades, but there are doubts over whether programmes are effective in preparing participants for the open labour market (Card, Kluve, & Weber, 2015). In the UK, the Sayce Review (2011) of the UK disability support system concluded that sheltered employment was ineffective and vastly costlier than alternatives, and recommended the sheltered employment system be wound down. Viser (1998) raised the concern that it wasn't clear whether sheltered employment was a permanent employment option for workers, since there were such low outflows from such programmes, or to prepare workers for the open labour market. Supported employment is aimed at individuals with disabilities but follows a supported job search model rather than direct employment. The approach has promising results in trials with specific groups of disabilities, with one randomised trial focusing

on individuals with mental illnesses showing a 61% employment rate on the competitive labour market compared to 23% in the control group (Bond, Drake, & Becker, 2008). Additionally, supported employment requires much lower investment per individual than sheltered employment (Cimera, 2008). The European Commission recommends supported employment as part of a wider flexicurity approach to tackling unemployment, but uptake varies considerably across different countries (European Commission, 2011). By taking the most disabled workers out of the labour market, sheltered employment could reduce the expected cost to employers of hiring disabled workers as the distribution of remaining workers changes. But given the low outflows and high cost, it is expected that countries that pursue sheltered employment will be ineffective at reducing employment gaps and at worst take resources away from more effective programmes. Sheltered employment effectively crowds out more efficient labour market programmes, and leads to a less efficient matching process.

Antidiscrimination legislation seeks to eliminate the influence of discrimination in the market and thereby achieve greater efficiency as well as fulfilling social obligations. Discrimination was discussed in detail above, and that discrimination can be sustained when there are different wage differentials or different bargaining positions in monopsonistic labour markets. Antidiscrimination legislation seeks to correct the market outcome to be closer to the competitive outcome, namely higher pay and employment of disabled individuals. A second influence of antidiscrimination legislation is inducing firms to make investments. Ensuring a building or workplace is accessible represents a sunk cost, even though a firm may benefit in the long term. Providing equipment or facilities to meet the needs of persons with disabilities represents an investment in human capital. The aggregate effects of a more accessible environment could provide externalities outside the firm, and higher investment in human capital increase the employment of disabled workers.

The counterpoint to antidiscrimination legislation is that firms are not undertaking these investments already, then the economic assumption would be that such investments were unprofitable. Different pay and participation rates may reflect deeper realities of the market about demand for different types of labour and equalities legislation prevents the market mechanism from reacting (Boeri & van Ours, 2013, p. 115). The disability employment penalty may not be related to discrimination supported by an imperfect labour market, but reflect productive differences between individuals. Antidiscrimination legislation would therefore represent a burden on business and wasting resources. This would support a model of the labour market closer to neoclassical theory. A further argument based on search theory is that antidiscrimination legislation represents additional employment protection legislation for disabled workers, therefore decreasing their job offer rate there is an anticipated additional firing cost. Whether the effect of antidiscrimination legislation has a

positive or negative effect on employment rates is ambiguous in theory. However, this paper hypothesises that the former effect dominates, namely that wage differentials are a stronger constraint than productivity, and reflect the theorised monopsonistic labour markets. This is due to developed nations moving away from manufacturing, and other physical labour-intensive industries, and therefore physical disabilities providing weaker constraints. A finding to the contrary would support models of the labour market closer to neoclassical theory.

## III. Research design

This section will set out the research design that the analysis will follow. The analysis will consist in a cross-country comparative analysis, and so the country selection will be justified, and a micro-analysis based on the individual observations from the pooled dataset. The data source for the analysis is the European Social Survey which will be described in further detail. A country comparative study is appropriate as the differences in the labour markets across countries will help uncover what mechanisms or features of those labour markets are most relevant for individuals with disabilities. Since the analysis is a country comparison, the variables will be aggregated for years and across countries. There will be a short summary of each variable and its values, and discussed in order of outcome variable, independent variables, and control variables. These variables will be used in both stages of the analysis that will be discussed at the end of this section along with the model specification. Following the model specification will be descriptive statistics of the dataset and the variables of analysis.

### Country selection

The hypotheses formulated in the introduction refer to developed economies with mature labour market institutions, and so this study will focus on this group of countries. The European Union provides an ideal group of nations for this comparison, as Europe is relatively wealthy and developed. The continent contains mature welfare states that are relatively stable and ingrained in individuals' expectations. Moreover, focusing on the EU helps control for large cultural differences that might arise from comparison cross continents. Finally, with the EU Directive 2000/78/EC, all member states are required to address discrimination in employment and with reference to disability as an area of potential discrimination. This provides a common legislative platform. This allows for greater confidence in estimates of the effect of labour market institutions as compared to nations with widely disparate attitudes or culture.

The EU provides interesting heterogeneity but a level of comparability between different nations. In many welfare state typologies based upon Esping-Andersen (1990), Europe contains the all the ideal-types partly due to its overrepresentation in these studies but also to the widely different political traditions between nations (for a summary see Arts & Gelissen, 2002). There is wide variation in policy traditions across the Nordic, Anglo-Saxon, Continental, and Mediterranean welfare states in the EU to use the typology of Sapir (2006). Moreover, these traditions are embedded

within the history of each nation, and so the outcomes can reflect relatively long-term impact including a focus on certain labour market institutions (Esping-Andersen, 1990).

The Financial Crisis provided a wide shock to the economies and labour markets of the EU, and nations pursued different approaches with regards to maintaining employment or not (see Armingeon, 2012). But additionally, the frameworks of labour market institutions affected how employment levels respond to the shock. The period following the adoption of EU Directive 2000/78/EC to after the Financial Crisis provides an ideal time-period to examine the effect of labour market regimes on the employment rates of people with disabilities. This period, 2002 to the present day, also contains reliable data that will provide greater confidence in the estimates than in earlier periods.

The specific EU nations included are discussed below as part of the dataset discussion, but in addition, Norway and Switzerland are included. These two nations are not part of the EU but are developed economies and have comparable legislative platforms. Norway implements EU legislation as a member of the EEA, and Switzerland provides equal levels of antidiscrimination regulation to EU Directive 2000/78/EC under the Federal Constitution of the Swiss Confederation of 18 April 1999. The inclusion of Norway and Switzerland is justified by these considerations and forms part of the set of countries under analysis along with EU nations.

**Data source**

The European Social Survey (ESS) is an academic initiative that has collected data since 2001 on individuals' social beliefs across European nations. Data is collected every two years (2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016) via face-to-face interviews, and the countries that participate vary by year, with some nations such as France participating in all rounds that have been completed and Albania only one year. The use of the ESS to measure disability employment rates was inspired by Geiger, van der Wal, & Tøge (2017), to the author's knowledge the first to use the ESS in this way. The methodology used by Geiger, van der Wal, & Tøge (2017) to determine the disability employment gap is the same as the one below, for which all credit must go to Geiger, van der Wal, & Tøge (2017) unless otherwise indicated and any errors are my own.

The ESS overcomes the flaws of other surveys of employment rates commonly used such as the European Labour Force Survey (LFS) or European Union Statistics on Income and Living Conditions (SILC). Firstly, the ESS has regular survey rounds with two-year gaps, overcoming the issues with the LFS which has only had a disability-focused ad hoc module for the 2011 wave.

Secondly, the ESS collects data through the same methods and questions in all countries, whilst the SILC only provides comparable outputs. Variations in the questions, data gathering technique (phone or face-to-face interview) can be seen to bias the results of the information gathered when asking questions on health (Croezen, Burdorf, & van Lenthe, 2016). The ESS provides the most comparable data between countries and time periods for the topics it covers.

The ESS is a social attitude survey, so the focus is not naturally on economic issues. However, it does contain questions which allow the required information to be extracted. A social approach to disability, endorsed by the UN CRPD, holds that an individual is disabled if they are hampered by a condition in carrying out their day to day lives, which is a question on the ESS:

*Question C8: Are you hampered in your daily activities in any way by any longstanding illness, or disability, infirmity or mental health problem? IF YES, is that a lot or to some extent?*

The responses either "*a lot*" or "*to some extent*", recorded as 1 or 2 respectively in the dataset, are counted as an individual as having a disability for the purposes of this analysis. The individuals' employment level is measured through a question on their activities in the past 7 days:

*F17a Using this card, which of these descriptions applies to what you have been doing for the last 7 days? Select all that apply. PROMPT Which others?*

The first response, "*in paid work (or away temporarily) (employee, self-employed, working for your family business)*" is counted as being employed and is recorded in the dataset under its own dummy variable ("pdwrk"). The measure prompts people to pick more than one option, therefore capturing part-time employment or those who are undergoing further education but still working in the meantime. There is a response for "*permanently sick or disabled*", but this does not appear to exclude respondents from also selecting employment (either by design or in the data) and it does not fully correlate with the disabled variable above. The lack of correlation between the disability variable and the very low numbers of individuals selecting this option means that it is discounted for this analysis. The dataset also contains standard information about participants such as age and education level, which is adjusted to a standardised measure across nations.

The measure of disability and measure of employment rate provides the information required to calculate the disability employment gaps for each nation in each year being measured. The justification for why the disability employment gap is the outcome measure is discussed in the next section. But before turning to this, the dataset extracted from the ESS will be examined further. A nation was included if it featured in at least 6 of the 7 rounds of the ESS from 2002 to 2014, and was an EU member state by at least 2004. This is because the ascension states of the 2004 EU enlargement

*Table 2: Countries included in the analysis, based on ESS waves*

| Country | Country code | 2002 | 2004 | 2006 | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Austria | AT | x | x | x | x | x | | x |
| Belgium | BE | x | x | x | x | x | x | x |
| Czech Republic | CZ | x | x | | x | x | x | x |
| Denmark | DK | x | x | x | x | x | x | x |
| Estonia | EE | | x | x | x | x | x | x |
| Finland | FI | x | x | x | x | x | x | x |
| France | FR | x | x | x | x | x | x | x |
| Germany | DE | x | x | x | x | x | x | x |
| Hungary | HU | x | x | x | x | x | x | x |
| Ireland | IE | x | x | x | x | x | x | x |
| Netherlands | NL | x | x | x | x | x | x | x |
| Norway | NO | x | x | x | x | x | x | x |
| Poland | PL | x | x | x | x | x | x | x |
| Portugal | PO | x | x | x | x | x | x | x |
| Slovenia | SI | x | x | x | x | x | x | x |
| Spain | ES | x | x | x | x | x | x | x |
| Sweden | SE | x | x | x | x | x | x | x |
| Switzerland | CH | x | x | x | x | x | x | x |
| United Kingdom | GB | x | x | x | x | x | x | x |

*Note:* an "x" indicates data available for that year

were harmonising with EU regulations in 2002, and therefore there is no need to exclude them from the analysis since the ascension states would have adopted EU Directive 2000/78/EC. This assumption may not hold for nations joining later than 2004. The final wave of the ESS (2016) was not included as not all of the country data has been published and nor have the post-stratification weights at the time of writing. Secondly, the requirement of inclusion 6 out of 7 waves provides a balance between maximising the amount of data whilst ensuring that there are no large gaps in country time-series. This leaves 19 countries in the analysis, with a total of 130 year-observations out of a potential total of 133. The countries included and the observation years included are indicated in Table 2. The age range of individuals was restricted to 15-64 years of age (<65 years of age) to use the widest definition of the labour force and including the minimum age of respondents to the survey. After this restriction, the number of observations by country-year varied from 804 individuals for Portugal in 2014 to 2,262 individuals for Germany in 2010. This gives a total of 188,029 observations across the 130 country-year observations, or an average of 1,446 observations per country-year. Compared to the SILC and LFS, the ESS samples are smaller but with an average sample size of 1,446 conclusions can be fairly accurately drawn even if the margin of error is slightly higher. In particular, the ESS benefits from a lack of measurement error regarding disability rates, which is

*Table 3: Countries not included in the analysis and the years that data of the ESS is available for each.*

| Country | Country code | 2002 | 2004 | 2006 | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Albania | AL | | | | | | x | |
| Bulgaria | BG | | | x | x | x | x | |
| Croatia | HR | | | | x | | | |
| Cyprus | CY | | | x | x | x | x | |
| Greece | GR | x | x | | x | x | | |
| Iceland | IS | | x | | | | x | |
| Israel | IL | x | | | x | x | x | x |
| Italy | IT | x | x | | | | x | |
| Kosovo | XK | | | | | | x | |
| Latvia | LV | | | x | x | | | |
| Lithuania | LT | | | | x | x | x | x |
| Luxembourg | LU | x | x | | | | | |
| Romania | RO | | | x | x | | | |
| Russia | RU | | | x | x | x | x | |
| Slovakia | SK | | x | x | x | x | x | |
| Turkey | TR | | x | | x | | | |
| Ukraine | UA | | x | x | x | x | x | |

likely to be more important than the margin of error. The consistency in sampling and questions across countries and time provides more confidence in the results than sample size for this situation (Geiger, van der Wal, & Tøge, 2017). In addition, the ESS post-stratification weights use the larger survey size of the LFS to calibrate their own results, using the demographic information of LFS respondents as a control group (ESS, 2014). This helps reduce the sampling error and non-response bias, whilst also retaining the measurement precision of the ESS. The countries that did not meet the criteria are shown in Table 3.

## Variables

### Outcome variable

*Disability employment gap:* To measure the degree of exclusion for people with disabilities, it is necessary to compare the situation to the counterfactual. In the labour market, the counterfactual is the likelihood of employment that an able-bodied individual would experience in that labour market. This can be measured by subtracting the employment rate of disabled workers as a percentage of the total disabled labour from the employment rate of able-bodied workers as a percentage of the total able-bodied labour force. This difference is defined as the disability employment gap. This is a

measure commonly used by nations such as the UK (Department for Work and Pensions, 2017), academic studies (Geiger, van der Wal, & Tøge, 2017), and the European Commission itself (European Commission, 2013). The measure is 0% for a country that has equal access to the labour market for both groups or a hypothetical top value of 100%, for a country where all able-bodied workers find employment but not a single disabled individual has a job. The employment rates of each group will be estimated using the ESS data for each country-year observation using the post-stratification weights included in the dataset.

For the micro-analysis, the outcome variable will be the employment variable ("pdwrk") discussed earlier that is used to calculate the disability employment gap. This is because on the micro-level, the analysis is considering individual observations and therefore there does not need to be an aggregated country-level outcome variable. Therefore, simply the analysis will measure to what extent the independent and control variables explain the variation in employment for individuals taking part in the ESS.

**Independent variables**

*Unions:* Excess coverage will be used to measure the overreach of unions. This variable represents the coverage of collective bargaining deals minus the union density rate. If the union density rate is 30% but the deals cover 50% of workers, the excess coverage is 20%. Even in countries with no extension laws, this value may not be zero due to deals spilling over to employees in the same workplace or firm. Total union density is also included as an additional union variable to test the robustness of the results. The data is sourced from the OECD (2018) statistics for union density and collective bargaining coverage of the workforce.

*Employment protection legislation:* There are three indicators for the strength of employment protection legislation: permanent contracts, group dismissal, and temporary contracts. These three measures may have differentiated effects, but this analysis is at the macro-level, so averaging the indicators provides a "birds-eye" view of the EPL environment. Given the low number of observations for the country level, separating these indicators would provide too many variables to gain meaningful, significant results. The values for these indicators have been drawn from the OECD (2018) Indicators of Employment Protections, and the average of the three values used as the indicator of EPL. The indicators can range from 0, indicating no EPL at all, to 6, indicating the strongest possible EPL. The proportion of the labour force affected by each area of legislation varies by country, such as the percentage of workers on temporary contracts or permanent contracts. Ideally,

the analysis would be able to weight each indicator by the proportion of the labour force affected by each indicator, and how this varies vis-à-vis disabled and able-bodied employees. However, such granular information is not available, and so no weighting has been applied. To ensure consistency, when the OECD has provided updated indices with new methodologies, the measure that is available back to 2002 is the indicator that was included. This is the version 1 indicator for both regular and temporary contracts (1985-2013), and the only indicator for collective dismissal (1998-2013). For more information about the indicators and how they are calculated, see OECD (2013).

*Benefit generosity of DI:* Benefit generosity is commonly evaluated using replacement rates, which measures the value of the transfer against average income or previous income (see Allan, 2004; Blanchard & Wolfers, 2001; Esping-Andersen, 1990; Nickell S., 1997). But these are not the only factors that influence the relative generosity, which I use to broadly mean the attractiveness, of a welfare system. To evaluate the overall attractiveness of unemployment insurance, Nickell, Nunziata, & Wolfgang (2005) detailed four elements to the attractiveness of benefits: "the level of benefits, the duration of entitlement, the coverage of the system, and the strictness with which the system is operated" (p4). This is a good basis for evaluating the generosity of disability insurance as well. It could be plausible to analyse the system of sickness insurance alongside DI, but this is not appropriate for this analysis. Sickness insurance is temporary and so it does not incentivise non-employment in the labour market. While it plausibly may act as a substitute to DI with fluctuating long-term illnesses, this would be more appropriate for further research studying the interaction between the two systems rather than be analysed here. Therefore, a measure will be created from the four elements highlighted above to create an overall score of attractiveness for a DI system. They are drawn from the OECD (2010) report *Breaking the Barriers* which carries an analysis of these four elements on a rating scale of 0-5:

> *Population coverage:* 0 indicates only employees covered, 5 indicates the whole population is covered
>
> *Minimum required disability:* only the minimum was analysed, as this represents the lowest barriers to entering the DI system. In addition, this is highly correlated with the disability level required for the highest level of benefit, and avoids double-counting the same DI scheme characteristic. 0 indicates 86-100% reduction in working capacity, 5 indicates 0-25% reduction in working capacity
>
> *Maximum benefit payment level:* using replacement rates, this evaluates the cash value of the transfer that an individual can receive. 0 indicates replacement rate of below 50% and no minimum specified, 5 indicates replacement rate of at least 75% or above.

*Permanence of payments:* examines the review process regarding continuing payments and how susceptible the payments are to being revised. 0 indicates strictly temporary entitlement, whilst 5 indicates strictly permanent entitlement.

These definitions and numbers are drawn from Annex 3.A1 (OECD, 2010, p. 99). Ideally it would be possible to track more precise estimates, especially of the replacement rate, but this is hampered by a lack of regular data and the heterogeneity of DI systems. This is complicated further, since payment is dependent on the level of incapacity, the actual replacement rate can vary significantly per person. Therefore, an aggregate measure that sums the 4 elements (for a maximum of 20 and minimum of 0) provides a good proxy for the attractiveness of the disability benefit system in each nation, even if it is somewhat imprecise and constant over the period of analysis.

*Active Labour Market Policies:* Active labour market policies are usually broken down into four different programme categories, but commonly ALMPs expenditure is used for analyses and is measured as a percentage of GDP to control for different economy sizes. There will be variation in the effectiveness of individual labour market policies, but this measure will capture the overall approach of a government in the labour market. The data for this comparison will be drawn from the OECD statistics. Additionally, the activation ratio will be calculated as a measure of how "activation-focused" a nation is. This is calculated as what percentage of all active and passive labour market policy expenditure is constituted of activation policies. The minimum is 0%, where all spending is on passive policies such as unemployment insurance, and the maximum is 100%, where all spending is on activation. This data is drawn from the OECD statistics. This will be used for the interaction with benefit generosity, as described below in the section setting out the regression specification.

*Sheltered employment*: one area that can bias ALMP spending as a percentage of GDP is expenditure on sheltered employment, which can cost vastly more than other active labour market policies (see Sayce, 2011). Unfortunately, the OECD aggregates both sheltered and supported employment, but this is included as an additional variable to measure to focus on sheltered employment. Sheltered employment has been found to have little private-sector employment stimulating effects (Card, Kluve, & Weber, 2015; Sayce 2011), but it does provide a direct impact on increasing employment for individuals with disabilities. It will not be able to capture the transfer between sheltered and supported employment, but this can be an area for further research. The data is measured as the percentage of GDP spent on sheltered employment, supported employment, and rehabilitation from OECD (2018) statistics, and divided by the disability rate of the country. This indexes the variable so that it doesn't just capture countries with a higher prevalence of disability.

*Antidiscrimination legislation:* measuring the strength of antidiscrimination legislation is a difficult task, as it requires analysis of the legislation, the requirements, and enforcement of the legislation. Such a detailed picture is unnecessary for the task at hand, and rough proxies will provide insight into certain governments dedication towards the goal of removing barriers for people with disabilities. There is a common legislative base, since all EU countries are bound by EU Directive 2000/78/EC, which provides a basic legislative framework. Differences can be found with the signing of the optional protocol of the UN CRPD that represents a country's willingness to face outside scrutiny for its actions and policies. Secondly, governments can ensure that there are dedicated public authorities to carry out the monitoring of reasonable accommodations and to distribute government funds to cover unreasonable accommodations for firms to cover (which is usually based on the size of the firm). Governments can take further steps to ensure there are disability-specific aspects to public employment services. This creates two variables to be counted as antidiscrimination. Firstly, a dummy variable representing whether the government has signed up to the CRPD, with the signatories drawn from the UN website. Secondly, a variable that varies from 0-2, 50% weighted to whether there are dedicated authorities for reasonable accommodations and 50% for disability specific aspects to public employment services. The data for this measure was drawn from European Parliament (2015). Both of these variables act as a proxy for government commitment to the requirements of by EU Directive 2000/78/EC, but they do not both measure the same thing. Reasonable accommodation authorities and disability-specific public employment services provide programmes to tackle disability labour market exclusion, whilst the UN CRPD is a willingness for the government to submit to outside scrutiny. To aggregate these two aspects into one measure would potentially obscure two different mechanisms. Whilst both measures are imperfect measures of commitment to antidiscrimination through policy programmes and legislative scrutiny, they are intended to capture an "attitude" of a government regarding disability issues and therefore are suited to the current analysis.

**Control variables**

Employment rates are driven by many different variables, such as whether the country is in a recession, and for this reason there is a need for certain control variables. Both able-bodied and disabled individuals face the same growth rate and country-specific effects. However, the higher the prevalence of disability in a nation the lower the disability gap would be expected to be. Higher disability prevalence can lead to lower disability gaps through two mechanisms, namely changing the composition of the disabled workforce and through reductions in labour market barriers. Firstly,

higher disability rates may reflect cultures where disability is more acceptable, and therefore the functional capacity which a person must lose to consider themselves disabled will be lower. These individuals will be more similar to able-bodied workers and have employment rates closer to these workers, thereby closing the gap. A second mechanism is that a higher disability rate means employers and society experience the barriers at a higher rate. It simply isn't rational to ignore barriers to employment when an increasing portion of the workforce (and consumers) have disabilities. Moreover, spillover effects from family members or colleagues experiencing disability provide experience lowers informational asymmetries of what is necessary to reduce these barriers. Once an employer has completed the process of accommodating a newly disabled employee, they will have fewer reservations or concerns about the next one. This follows from the model that relaxes the assumption of perfect information – employers will not face an information cost in accommodating that second employee. The marginal cost, in terms of information, continually decreases. These two mechanisms are not exclusionary or exclusive, but provide two plausible mechanisms for higher disability prevalence to result in lower disability employment gaps. Therefore, the disability rate will be controlled for when analysing the disability employment gap.

As mentioned earlier, the Financial Crisis is a significant event in the period under analysis and this needs to be recognised in the specification. In addition, the Eurozone crisis followed the crisis adding further turbulence to the macroeconomic environment for all the European nations. Rather than controlling for all factors to do with these crises, such as GDP growth, the analysis will contain some dummy time variables to denote the macroeconomic turbulence following 2008. This includes a variable for 2008, the crisis itself, as well as a post-crisis variable to measure from 2010 onwards. The unstable macroeconomic environment of Europe hit different groups of the population worse, such as youth employment, and so these variables will capture what effect this had on disabled workers.

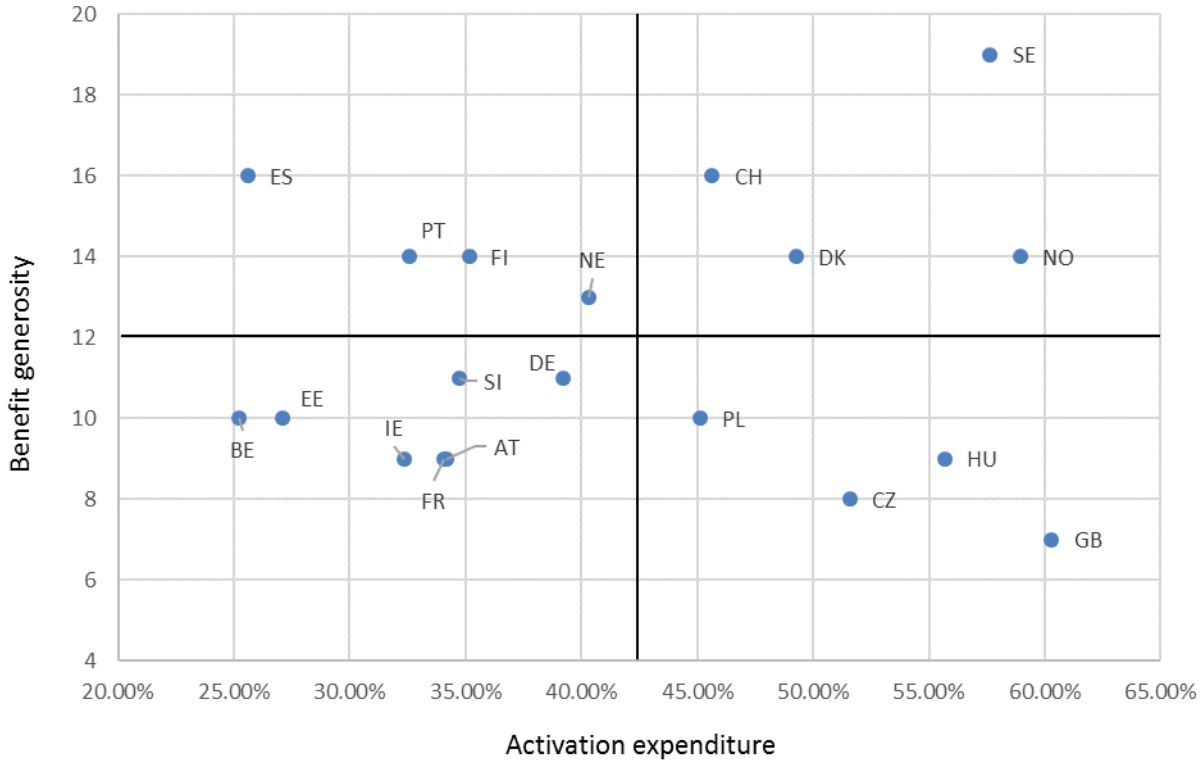
There are elements of the welfare state and labour market regimes that cannot be captured fully by the variables described above. Esping-Andersen (1990) claimed that welfare states were more than just the sum of their social policies, but also the principles, legal, and institutional frameworks embedded from a nation's history. While each nation is slightly different, a categorisation exercise can help identify broad groups that, given they are similar in the observed measures, their welfare states are expected to be similar in the unobserved characteristics. Creating some country clusters allows for certain groups of nations to be compared with one another, and while these clusters will not be a variable of analysis, the interaction between variables forming the categorisation will be included. The following section provides more detail on this exercise.

**Country categorisation**

The categorisation is based on a broad definition of push and pull factors; policies that push individuals into the labour market and incentives that pull people out of the labour market and enter welfare programmes or economic non-participation. Esping-Andersen (1990) used the measure of 'decommodification' that focuses on the generosity of welfare states, and stratification that highlights the social impact of policies. However, the latter dimension is particular less relevant for the current discussion. Sapir (2006) used efficiency and equity as the two axes to evaluate welfare states against, resulting in four clusters relating to the four quadrants of the typology. This widely followed approach is insightful, but it must be adapted for this case. Equity and generosity follow similar principles – the maintenance of income with respect to wider society. Secondly, efficiency is in promoting employment outcomes. Considered in a disability employment context, the fraction of total labour market policy expenditure that constitutes activation policies provides a good measure. The data for the activation rate is the average activation ratio across the time period examined, and an average was used so that anomalous years would not distort the position of a nation.

Figure 3 shows the nations under consideration plotted against these two scales. There are four clusters that appear from Figure 3, and ones that roughly match up to expectations from other welfare state models. In the top left corner, Portugal and Spain commonly make up the Mediterranean model, but are joined by Finland and the Netherlands in this case to create cluster 1. The Netherlands provides a borderline case, and its hybrid type often leads to difficult classification (see Arts & Gelissen, 2002), and so this counterintuitive grouping does not imply the typology has completely inverted expectations. The Netherlands also has a largely private DI system with employer responsibilities regarding activation of newly disabled employees, therefore some activation expenditure may be obscured by this measure. The top right corner includes commonly cited Nordic countries, along with Switzerland to form cluster 2 and seems to gather the wealthiest nations together. The bottom right contains the UK, sometimes considered the model Anglo-Saxon type but joined by most (and the largest) of the Eastern European nations in the analysis to form the third cluster. Finally, the bottom left corner contains many Continental nations, but joined by Ireland and the smallest Eastern European nations to make cluster 4. Ireland's position may be somewhat distorted by how badly it was hit by the recession, with just over 20% of its labour force receiving some form of passive labour market transfer in 2010, up from 7.3% in 2007. However, only in 2002 would have the activation expenditure been high enough for Ireland to have been placed in cluster 3, so its current classification seems most suitable.

*Figure 3: Benefit generosity and percentage share of activation expenditure of ALMPs for the 19 EU nations in the analysis*




The similarity and differences compared to the common welfare state typologies provide support to the categorisation exercise. Firstly, the similarities provide confidence that this typology follows convention with regards to certain countries being similar. If the Nordic nations were split across all four quadrants, then there would be validity concerns with these results being far different from other research. But, some difference is to be expected due to the narrow focus on disability employment issues. Firstly, the placement of some nations, such as the Netherlands or Eastern European nations, is always in contention and there are very few nations that are universally in one group (Arts & Gelissen, 2002). But, the results do fit with other single-country examinations of disability regimes, such as with Spain (Silva & Vall-Castello, 2012), or Denmark's flexicurity model of high benefits and high activation sitting in the correct quadrant.

The categorisation exercise is not meant to provide a thorough understanding of the different disability labour market regimes, but to illustrate the broad approaches that different nations take. It provides an interaction variable to be tested (between activation and generosity), and the robustness of this interaction will be tested by the regressions. If the interaction can provide a level of explanation in the model, then this can direct further research into certain country groups and highlight the heterogeneity of welfare states across different areas of social policy.

**Method of analysis**

The first analysis is a macro-level analysis to test the importance of labour market institutions in explaining the disability employment gaps across countries. It uses the ESS to estimate the disability employment gap in each country for each year using the method described in the variable section. The individual observations used to calculate the disability employment gap are weighted using the post-stratification weights supplied by the ESS. Variables for the labour market institutions are added to each country-year observation. The values for employment protection legislation is lagged to account for the policy time-lag. Unions are expected to have a more immediate effect due to yearly wage agreements for many workers, and so the excess coverage and union density for that year is included. For other variables, such as benefit generosity and antidiscrimination legislation, will be constant across time periods for the reasons detailed above regarding data availability and the lack of radical change. Following the lead of Belot & van Ours (2004), key institutions will be interacted with each other to capture the relationships between key variables. It is not just the institutions, but the frameworks that they form as well. There will be two control variables, the disability rate for the country for the year in question and time dummies to denote the Financial Crisis (2008) and post-Crisis period (2010-2014). Clustered standard errors are used to take into the account the use of panel data and are clustered on each country. Not all variables will be included in each model, but the broadest specification is represented below with $j$ indicating a country ($j = 1,..J$ ), and $t$ ($t = 1,...T$ ) indicating the year. The $\beta$ coefficients capture the effects of institutions alone, whilst $\gamma$ coefficients capture the effect of interactions, and for expositional reasons, only benefit generosity and activation focus have been used as example variables for institutions in the below specification:

$$
\begin{aligned}
Dis\ employ\ gap_{jt} \\
&= \alpha + \beta_1 Benefit\ Generosity_{jt} + \beta_2 Activation\ focus_{jt} \\
&+ \ \ldots\ \gamma_1 \left(Benefit\ generosity_{jt} x\ Activation\ focus_{jt}\right) + \ \ldots\ \delta_1 Crisis_t \\
&+ \delta_2 Postcrisis_t + \rho Disrate_{jt} + \epsilon_{jt}
\end{aligned}
$$

The models for the micro-analysis were created by adding the country-level institutional variables to the individual observations of the pooled ESS dataset. The outcome variable in the micro-analysis is not the disability employment gap, but whether the individual is in employment or not. Each of the explanatory and control variables were interacted with the disability variable. This allows for the effect on able-bodied and disabled individuals to be separately calculated. Standard errors were clustered on countries, and the post-stratification weights were used. Rather than controlling for each year, a time variable, "postcrisis", was included to capture 2008 and later years. This combines the crisis and postcrisis2 variables from the country-level analysis so the effect of 2008

cannot be singled out, but this does not add to the analysis significantly. In line with the macro-analysis, the specification for the micro-level model is represented below with *i* ( *i = 1,..I*) indicating an individual, with *j* (*j=1,...J*) indicating their country, *t* (*t = 1,...T* ) indicating the year and with benefit generosity and activation focus as example institutions:

$$\begin{aligned} Employed_{ijt} = \ & \alpha + \varphi Disabled_{ijt} + \beta_1\left(Disabled_{ijt} x Benefit\ generosity_{jt}\right) \\ & + \beta_2\left(Disabled_{ijt} x Activation\ focus_{jt}\right) \\ & + \ldots \gamma_1(Disabled_{ijt} x\ (Benefit\ generosity_{jt} x\ Activation\ focus_{jt})) \\ & + \delta(Disabled_{ijt} x\ Postcrisis_t) + \epsilon_{ijt} \end{aligned}$$

**Data description and statistics**

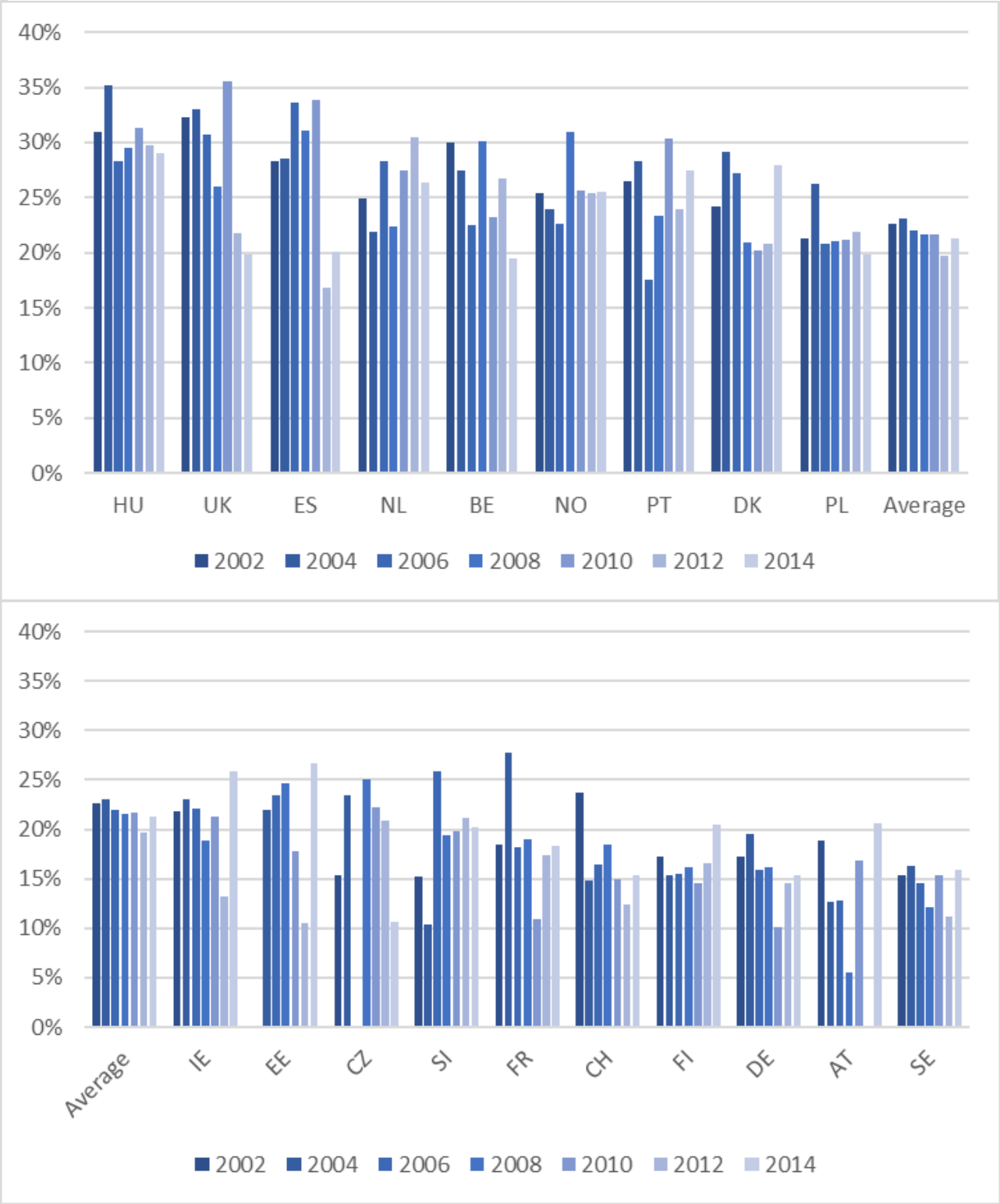
**Disability employment gaps**

Figure 4 shows the results from regressing disability on employment for each country-year using the post-stratification weights provided by the ESS, where *i* represents the country and *t* represents the year. The coefficient $\beta$ represents the disability gap:

$$Employ_{ijt} = \alpha - \beta_j\ Disability_{ijt} + \epsilon_{it}$$

The results in Figure 4 are the negative coefficient of disability for each country-year. There are a few observations that can be made from Figure 4. Firstly, there are certain countries that do consistently poorly, such as Hungary and the UK until 2010, and others that do consistently well, such as Sweden and Germany. But generally, there is a lot of variation from year to year, with many countries appearing to change by up to 10-15% in a two-year period. This could reflect an issue regarding sample size with the ESS, but also the volatility of the period under examination. For example, Ireland's employment rate for able-bodied individuals fell from 71% to 50% from 2006 to 2010 which partly reflects how hard the country was hit by the Financial Crisis. In another example, the employment rate of the Netherlands in the underlying data only began to fall from 2010 onwards, and Belgium remained consistent across the entire time period. Whilst these estimates would certainly be improved by an increased sample size, volatility alone is not a reason to doubt their relative accuracy. Comparing the rates to the Eurostat (2015) analysis of the 2011 LFS, there are some similarities in the estimated rates. Finland, France and Sweden have low gaps, whilst Hungary and the UK have relatively large gaps. But if there are measurement errors, they are likely to be for the countries with the smallest sample sizes.

*Figure 4: Disability employment gaps for the 19 nations under analysis, ordered from largest to smallest using the average disability employment gap*




A second observation is that over the long term it appears the disability employment gap is decreasing within the countries over time. This can be seen with the average disability employment gap, which overall is declining despite a rise in 2014, which is most likely a return to trend after 2012's larger fall. The financial crisis seems to have an impact on the disability employment gaps,

*Table 4: Standard deviation of the disability employment gaps between countries for the years observed*

| 2002 | 2004 | 2006 | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|---|---|
| 0.0546 | 0.0669 | 0.0588 | 0.0647 | 0.0723 | 0.0594 | 0.0497 |

with half of the nations experiencing a fall in 2008, and the same for 2010. The two groups of nations experiencing a fall in either 2008 or 2010 are quite different; only Denmark and the Czech Republic experience falls in both years, whilst only Hungary, Poland, and Portugal experience a rise in both years. In the years following the crisis the standard deviation between the disability employment gaps, seen in Table 4, begins to decrease, indicating convergence between countries as well, however there aren't many year observations to confirm this.

**Disability rates**

Table 5 shows the disability rate for each country-year as calculated by the ESS data. Disability rates are expected to be relatively constant, or at least follow a consistent trend as, unlike employment, disability is a relatively permanent condition for an individual. Therefore, any large changes in disability rates can be seen as a robustness check for the data and whether there may have been unrepresentative samples in the data. Broadly the data passes this test; most states show a consistent trend in the disability rates. The variance between countries is far greater than within countries, with only Germany and Slovenia reaching a within country variance of around 0.001 and an average within country variance of 0.0004, while the average between country variance of 0.0024. For wealthier and Western European nations there is an increasing trend in disability, such as in Belgium, France and the Netherlands. However, Eastern European states seem to have declining disability rates, such as Hungary and the Czech Republic, with Poland staying at a relatively constant rate. The lowest disability rates are to be found in Portugal and Spain, whilst the highest are in the Nordic nations. This can be correlated to demographic changes in countries, and due to the self-definition of disability. Certain countries may have improved their accessibility, thereby reducing the number of people that consider themselves hampered in their daily activities. Or on the other hand, increasing stigmatisation of disability can lead to decreasing willingness for individuals to label themselves as such. However, certain jumps such as Slovenia in 2012 and Portugal's fluctuation between 10-15% from 2006-2014 does provide some cause for concern. It is implausible that for the former, disability would fall 5% in two years and then increase 8% two years later. This is likely due to the sample size, as Portugal had the smallest sample size of all the participating countries. Furthermore, the ESS provides confidence that the differences in disability rates are not due to measurement error with the

*Table 5: Self-reported disability rates in the ESS samples across nations from 2002-2014*

| Country | 2002 | 2004 | 2006 | 2008 | 2010 | 2012 | 2014 |
|---|---|---|---|---|---|---|---|
| Austria | 17.5% | 17.1% | 19.6% | 18.9% | 19.3% | | 15.5% |
| Belgium | 18.1% | 16.8% | 18.0% | 19.5% | 20.2% | 21.0% | 21.9% |
| Czech Republic | 22.6% | 22.9% | | 23.9% | 21.0% | 16.3% | 18.8% |
| Denmark | 21.5% | 20.4% | 23.2% | 25.0% | 24.2% | 22.6% | 27.9% |
| Estonia | | 17.0% | 17.8% | 17.3% | 17.5% | 22.7% | 18.6% |
| Finland | 23.1% | 25.7% | 25.4% | 26.7% | 29.4% | 28.4% | 27.5% |
| France | 18.6% | 16.4% | 19.7% | 18.9% | 18.7% | 19.9% | 19.4% |
| Germany | 21.2% | 21.8% | 20.7% | 21.9% | 24.4% | 29.4% | 27.1% |
| Hungary | 23.3% | 22.4% | 22.7% | 21.8% | 22.5% | 19.0% | 18.8% |
| Ireland | 11.3% | 10.8% | 13.1% | 14.2% | 11.2% | 13.6% | 13.1% |
| Netherlands | 21.8% | 22.1% | 21.1% | 22.2% | 22.7% | 23.6% | 26.2% |
| Norway | 20.5% | 23.4% | 22.7% | 24.3% | 23.7% | 23.8% | 24.7% |
| Poland | 21.5% | 22.6% | 22.5% | 20.6% | 20.1% | 20.6% | 21.4% |
| Portugal | 8.7% | 11.7% | 15.3% | 11.4% | 10.4% | 10.5% | 15.9% |
| Slovenia | 27.4% | 25.3% | 25.4% | 21.3% | 23.1% | 18.1% | 26.3% |
| Spain | 9.9% | 9.7% | 10.0% | 7.7% | 9.3% | 11.6% | 10.6% |
| Sweden | 24.1% | 25.2% | 24.4% | 22.5% | 23.9% | 23.8% | 26.1% |
| Switzerland | 14.7% | 15.5% | 15.2% | 14.8% | 14.9% | 15.0% | 17.5% |
| United Kingdom | 18.5% | 19.8% | 19.2% | 17.2% | 19.6% | 19.1% | 20.4% |
| Average | 19.1% | 19.3% | 19.8% | 19.5% | 19.8% | 19.9% | 20.9% |

consistency in data gathering across countries. These points considered, the dataset can be seen overall as reliable with only a few anomalies mentioned above.

**Country level dataset**

The results from the ESS pooled dataset completes the country level dataset with institutional variables from the OECD or EU-related sources described in the research design. The mean, standard deviation, minimum, and maximum values of the variables are shown in Table 6. It was not possible to obtain values for all variables, such as EPL indicators for Estonia and Slovenia before 2008 and ALMP spending for the UK post-2011. This leaves a total of 120 country-year observations that are

*Table 6: Descriptive statistics of the country-level dataset and the variable names*

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Disability employment gap (disgap) | 130 | 0.217 | 0.062 | 0.055 | 0.356 |
| Disability rate (disrate) | 130 | 0.198 | 0.049 | 0.077 | 0.294 |
| EPL indicator: total (eplsum) | 125 | 2.350 | 0.489 | 1.450 | 3.420 |
| EPL indicator: regular contracts (eplreg) | 125 | 2.333 | 0.685 | 1.100 | 4.580 |
| EPL indicator: collective dismissal (eplcol) | 125 | 3.098 | 0.754 | 1.630 | 5.130 |
| EPL indicator: temporary contracts (epltemp) | 125 | 1.624 | 0.912 | 0.250 | 3.630 |
| Benefit generosity (bengen) | 133 | 11.737 | 3.155 | 7 | 19 |
| Excess union coverage (excov) | 133 | 34.109 | 24.978 | 0.4 | 90.6 |
| Union density (unidens) | 133 | 31.370 | 20.889 | 6.0 | 76.9 |
| Activation ratio (actrat) | 133 | 0.406 | 0.152 | 0.159 | 0.766 |
| ALMP spending - % GDP (almp) | 128 | 0.725 | 0.389 | 0.060 | 2.040 |
| Sheltered employment spending - % GDP(shelt) | 133 | 0.123 | 0.155 | 0 | 0.650 |
| Sheltered employment spending, normalized by disability rate (sheltdis) | 130 | 0.687 | 0.842 | 0 | 3.622 |
| Ratified UN CRPD (uncrpd) | 133 | 0.632 | 0.484 | 0 | 1 |
| Disability programmes: PES and RA (pesra) | 133 | 1.158 | 0.815 | 0 | 2 |

*Note:* for the "pesra" measure, PES refers to disability specific programmes in public employment services, and RA refers to specific public authorities tasked with ensuring workers with disabilities receive the reasonable accommodations they require in the workplace

complete for all variables. The number of observations in combination with clustered standard errors provides limited variation in the sample and this can be seen as a limitation of the dataset. However, the results in the following section show that key insights can still be drawn.

## IV. Results

### Macro-level analysis

The macro-analysis consists of two parts, first with labour market institutions alone and then with interactions between key institutional variables, including the activation-generosity interaction used for the categorisation exercise. The model variations will be discussed before the results of each set of models in turn. Standard errors clustered on country are used throughout.

### Model variations

The macro-analysis first examined the institutional variables without including the institution interactions, and tested a total of 5 different model variations. Models 1-4 progress by adding more variables or controls, whilst model 5 removes some variables measuring similar effects to create a preferred model. This was motivated by the limited variation in the dataset due to the low number of country observations, creating a trade-off from the added explanatory power of the model and between the reduced degrees of freedom. Model 1 begins with just the variables of interest identified by the theory, with antidiscrimination legislation represented by both "uncrpd" and "pesra". Model 2 adds controls to capture the effect of the Financial Crisis in 2008 ("crisis") and the years following ("postcrisis2"). Model 3 adds additional variables relating to unions and ALMPs, and model 4 includes the disability rate, the variance of which across nations and years can be seen in Table 5. Finally model 5 tests the "sheltdis" measure of indexed sheltered employment expenditure (normalised by disability prevalence in a country), as this focuses specifically on disabled workers, and removes the other ALMP measures and the time variables.

Models 6-10 introduce interactions between institutions used in models 1-5. Following the categorisation exercise, benefit generosity and the activation ratio are interacted to replicate the different country clusters. The second interaction is ALMP spending interacted with sheltered employment, reflecting the effect of high ALMP spending being a result of a focus on this disability-specific programme. Finally, the UN CRPD measure and PESRA measure are interacted to reflect the impact of a comprehensive approach as well as the independent effects of each variable. The interactions are in all of the models, and further variables are added sequentially. Model 6 begins with just the interactions and the EPL and excess coverage measure (as these are not represented in the interactions). Model 7 uses just the interaction terms and the variables that each interaction involves, and then models 8-10 add further institutional and control variables.

**Institutional variables**

Models 1-5 provide two key insights, namely that the significance levels of the institutions alone generally are weak and that for most institutions their effect is relatively stable across models. None of the models find a significant effect from the institutions at even the 90% level, and with adjusted $R^2$ values between 0.15-0.20, this implies that the models have relatively little explanatory power. There appears to be at least one significant factor that the models are missing. Secondly, there are some consistent institutions that appear to be relevant. The analysis suggests that the EPL-measure and excess union coverage are the variables with the most significant results. If the coefficients are standardised using the results from model 1, "eplsum" is 0.34 and "excov" is -0.34, which gives each an approximately similar impact given a one standard deviation change. Benefit generosity remains relatively stable but inconsistent, and "pesra" is fairly strongly affected by the inclusion of the time controls. Using model 1 again to standardise, the "pesra" coefficient is 0.25, placing it weaker than "excov" and "eplsum" if considering a one standard deviation change. However, what is not expected is the sign of the coefficient. The "pesra" measure indicates that a country has dedicated programmes for disabled workers in its public employment services and that a public authority is tasked with ensuring workers with disabilities get the accommodations and adaptations necessary to remain in work. For the coefficient to be positive implies that the presence of these programmes and government authorities is associated with an increased disability employment gap.

The institution-only analysis stands out for what it doesn't show rather than what it does find. None of the institutional variables are significant, and the explanatory power of the models are fairly weak. Of particular interest is the lack of significance of benefit generosity. Once again, standardising the coefficient of benefit generosity using model 1, the coefficient of -0.09 is much weaker than the other institutions and the opposite sign to what the theory would suggest. Given the heavy interest and research into the income and substitution effects of disability insurance payments, finding welfare payments to be insignificant or employment promoting would be highly unusual. Finally, ALMPs, whether measured in aggregate, as a ratio, or for disability-specific programmes did not appear to have a large effect on the disability employment gap. This may be due to the measure of disability employment gap – whilst ALMPs might promote employment, they may boost employment of disabled and able-bodied workers by the same nominal amount and leave the gap unchanged. However, this should not be the case for sheltered employment, as this is only targeted to disabled workers. Should the insignificant result persist, this would support the conclusion of Sayce (2011) and others that sheltered employment is inefficient at boosting employment outcomes.

*Table 7: The effect of institutional variables on the disability employment gap, using OLS*

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| eplsum | 0.04313 | 0.04178 | 0.04940 | 0.04371 | 0.04248 |
| | (1.40) | (1.35) | (1.55) | (1.35) | (1.40) |
| bengen | -0.00169 | -0.00168 | -0.00093 | -0.00223 | -0.00193 |
| | (-0.46) | (-0.45) | (-0.22) | (-0.51) | (-0.50) |
| excov | -0.00086 | -0.00084 | -0.00099 | -0.00090 | -0.00104 |
| | (-1.41) | (-1.36) | (-1.53) | (-1.34) | (-1.47) |
| unidens | | | -0.00051 | -0.00015 | -0.00022 |
| | | | (-0.78) | (-0.23) | (-0.39) |
| actrat | | | 0.02076 | 0.06207 | |
| | | | (0.30) | (0.93) | |
| almp | -0.02247 | -0.02333 | -0.00155 | -0.00567 | |
| | (-0.94) | (-0.97) | (-0.05) | (-0.18) | |
| shelt | | | 0.04749 | 0.01531 | |
| | | | (0.54) | (0.23) | |
| sheltdis | | | | | 0.00706 |
| | | | | | (0.56) |
| uncrpd | 0.00431 | 0.00454 | 0.00376 | 0.00544 | 0.00535 |
| | (0.16) | (0.17) | (0.14) | (0.20) | (0.21) |
| pesra | 0.01909 | 0.01902 | 0.01482 | 0.01546 | 0.01536 |
| | (1.22) | (1.20) | (0.87) | (0.97) | (1.12) |
| bengen*actrat | | | | | |
| | | | | | |
| almp*sheltdis | | | | | |
| | | | | | |
| uncrpd*pesra | | | | | |
| | | | | | |
| postcrisis2 | | -0.01448 | **-0.01751** | -0.01343 | |
| | | (-1.62) | (-1.89) | (-1.50) | |
| crisis | | -0.01270 | -0.01367 | -0.01448 | |
| | | (-1.25) | (-1.15) | (-1.26) | |
| disrate | | | | -0.27018 | -0.21073 |
| | | | | (-1.01) | (-0.78) |
| cons | **0.15622** | **0.16736** | **0.13842** | **0.19162** | **0.19772** |
| | (2.16) | (2.30) | (2.02) | (2.20) | (2.32) |
| Adjusted $R^2$ | 0.1556 | 0.1678 | 0.1932 | 0.2187 | 0.1985 |

*Note:* T values are in parentheses, and all results significant at the 90% level or higher are highlighted in bold. All coefficients are reported to 5 decimal places.

**Adding interactions between institutions**

Comparing models 6-10 provides a range of insights on the institutional variables and how they interact. The work of Belot & van Ours (2004) would provide the expectation that interaction terms will make institutional variables alone less significant as it is the framework, not the institution alone, that has the largest impact. However, the results do not support this expectation. Only the generosity-activation interaction gains significance, and this implies the previous categorisation exercise was focused on the important dimensions with respect to disability employment gaps. Both the activation ratio and benefit generosity measure are both positive and the interaction term is negative, meaning each variable independently increases the employment gap. This implies the best two quadrants (from the categorisation exercise) for disability employment gaps are the top left and bottom right quadrants, clusters 2 and 4. As mentioned this would commonly be referred to as the Nordic or Continental quadrants, and it would be counter to Sapir's (2006) ranking that put the Nordic and Anglo-Saxon (cluster 3, high activation and low benefits) as the first and second best welfare states respectively. Furthermore, this implies that one the way to keep individuals with disabilities close to the labour market is to pay low benefits but attach few activation conditions to the recipiency of those benefits. An activation focus in labour policy provides a strong incentive towards non-participation unless countered by the offer of high benefit transfers. This can be explained by search theory, where activation represents a higher cost to job searching and incentivises fewer rounds of searching before discontinuing. The high benefits increase income, and therefore this higher cost can be sustained for longer. This result is both useful for public administration and for theoretical economic modelling. Whilst it may reduce welfare state expenditures, activation alone might not lead to the highest possible employment rates.

The institutional variables alone gain significance and remain relatively stable across the different models. Benefit generosity, once the activation interaction is controlled for returns to expectations with a positive and strongly significant coefficient. As discussed above, the activation measure is very strong and significant which may be due to the mechanism specified above through discouraging seeking welfare transfers. However, given its strength, it may be reflecting another characteristic shared by the high activation countries in cluster 3. None of the robustness checks carried out, such as interacting with ALMP to see whether it was low ALMP expenditure in general, indicated what the omitted factor would be. Therefore, the results currently support the additional cost to job search mechanism as part of search theory. Comparing the key significant variables, the EPL measure varies by 2 and so can explain at maximum approximately 11.5% of the disability employment gap from models 6-10. Using the same logic for benefit generosity and excess coverage, they would explain at maximum 31% and around 8% of the gap respectively. Given that the

*Table 8: The effect of interactions between institutional variables on the disability employment gap*

| | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|
| eplsum | 0.04528 | | **0.05728** | **0.05614** | **0.05928** |
| | 1.49 | | 2.11 | 2.07 | 2.06 |
| bengen | | **0.02530** | **0.02682** | **0.02653** | **0.02533** |
| | | 4.10 | 4.78 | 4.59 | 3.78 |
| excov | -0.00092 | | **-0.00088** | **-0.00082** | -0.00097 |
| | -1.33 | | -2.03 | -1.91 | -1.63 |
| unidens | | | | | -0.00022 |
| | | | | | -0.34 |
| actrat | | **0.77672** | **0.85380** | **0.86184** | **0.82077** |
| | | 4.98 | 4.30 | 4.67 | 4.12 |
| almp | | -0.03693 | -0.02345 | -0.02645 | -0.01823 |
| | | -1.27 | -0.94 | -1.04 | -0.52 |
| shelt | | | | | |
| | | | | | |
| sheltdis | | **-0.03166** | -0.02072 | -0.02288 | -0.01933 |
| | | -1.81 | -1.46 | -1.56 | -1.04 |
| uncrpd | | 0.00420 | 0.03320 | 0.03418 | 0.04187 |
| | | 0.15 | 1.06 | 1.13 | 1.06 |
| pesra | | **0.02794** | **0.04097** | **0.04089** | **0.04383** |
| | | 1.72 | 2.44 | 2.41 | 2.15 |
| bengen*actrat | -0.00512 | **-0.05986** | **-0.06472** | **-0.06445** | **-0.06099** |
| | -0.98 | -4.90 | -5.60 | -5.74 | -4.33 |
| almp*sheltdis | 0.02259 | 0.05945 | 0.04231 | 0.04706 | 0.04058 |
| | 0.95 | 1.44 | 1.29 | 1.37 | 0.92 |
| uncrpd*pesra | 0.00447 | -0.01187 | -0.03225 | -0.03296 | -0.03798 |
| | 0.29 | -0.60 | -1.48 | -1.56 | -1.42 |
| postcrisis2 | | | | -0.01432 | -0.01431 |
| | | | | -1.41 | -1.40 |
| crisis | | | | -0.01589 | -0.01662 |
| | | | | -1.34 | -1.27 |
| disrate | | -0.10091 | | | -0.00312 |
| | | -0.43 | | | -0.01 |
| cons | **0.15541** | -0.09165 | **-0.27301** | **-0.26266** | **-0.25359** |
| | 2.15 | -0.91 | -2.03 | -2.01 | -1.82 |
| | | | | | |
| Adjusted $R^2$ | 0.1308 | 0.2552 | 0.3574 | 0.3718 | 0.3734 |

*Note*: T values are in parentheses, and all results significant at the 90% level or higher are highlighted in bold. All coefficients are reported to 5 decimal places.

maximum gap is 35%, it seems that this would give significant weight to benefit generosity and the least for the "pesra" measure explaining at maximum approximately 4%. The indexed sheltered

employment measure decreases in significance as more variables are added, indicating that the effect is small or capturing the effect of other omitted variables in earlier models.

The cross-country analysis has provided interesting insights into the interactions between policies and institutions alone. Neither interactions alone nor institutions alone provide a model with significant explanatory power, but across the models there have been surprising results regarding disability-specific policies ("pesra"). The benefit generosity-activation interaction is the most significant, and is in line with expectations given the country categorisation exercise. The economic model of search theory is able to explain many of the results once the interactions are added, with search theory able to explain the EPL, benefit generosity, and activation results as well as why the benefit generosity-activation interaction is significant. The remaining results are not yet fully explained, but have not provided results that pose a serious challenge to the theoretical model. The public administration implications are not yet clear, and require further analysis due to the use of the disability employment gap as an outcome measure. The disability employment gap is an interesting measure as it allows for country-specific effects to be held constant and measures the relative level of exclusion, but it has limitations. Most importantly, doesn't tell us whether an effect is from one group benefitting disproportionately or from suffering disproportionate harm. The labour market institutions probably do not impact all individuals the same, such as older workers' concerns over retirement or younger workers on average faced with less permanent employment opportunities. To gain a full understanding of the impact of labour market institutions on individuals with disabilities, it is necessary to examine the relevance of different institutions for demographic groups.

## Micro-level analysis

### Model variations

The regressions are split into two parts like the macro-analysis, first testing institutions alone then including the interaction between institutions. Instead of changing the variables like with models 1-10, the micro-analysis varies the demographic portions of the population that the regression is run for. What this means is that the regression specification in the research design was run for each age band individually and restricted to that age band alone for example. The age bands were divided into 15-24, 25-34, 35-44, 45-54 and 55-64 years of age. This was repeated for gender and education. Education was split into high and low education, with an individual counting as high education if their standardised education level was higher than the average level of education in the sample. Education was measured by the standardised "eisced" variable in the ESS dataset that provides a comparable measure across the countries examined. The number of observations for education is

lower, as there was a significant number of individual observations that could not be categorised on this scale. Given that this was concentrated on a few countries, this may bias the results for education to a degree but also results in higher standard errors. The results for education should be taken with more caution, but can still provide insight.

Only the benefit generosity-activation interaction will be included for the second part, as it was the only interaction found to be significant during the macro-analysis and it identifies the different country clusters from the categorisation exercise. By zooming into one interaction, this also prevents the models from becoming overcomplicated, and the mechanisms of action remain clearer. The activation ratio variable was excluded as an institutional variable as it was capturing a lot of the effect of being disabled, rendering the disability coefficient positive (as in becoming disabled increased employment rates). This is likely due to high activation nations having higher disability rates, as the disability rate was not kept as a control variable. Replicating the regressions for one interaction term is suitable, as the first set of results is across countries broadly, whilst the second set controls for the country clusters identified by the categorisation analysis. For brevity, only the institutional variables are included in the results table and not the time control variable ("postcrisis") or constant (which represents the employment rate for able-bodied individuals across the dataset). For the full results table, please see Appendix 1.

**Institutional variables**

Table 9.1 and 9.2 shows the results of the first set of regressions, and the tables are separated for clarity of reading so each row represents one regression. The coefficients for the whole dataset under "Total" replicate some of the country-level results, showing EPL, benefit generosity, and excess coverage to be important institutions in determining employment likelihood. Any divergence between able-bodied and disabled individuals with regards to institutional variables can lead to an increased disability employment gap. Interestingly, it shows that for disabled workers excess union coverage is significant at increasing employment rates, and union density appears to have an overall positive, but insignificant impact for both able-bodied and disabled workers. This is contrary to expectations earlier, where the union variables were expected to act as a friction in the job search function. This implies in fact that the main effect may be instead to with improving the position of workers within monopsonistic markets.

Segmenting the effect of institutions across age bands leads to interesting differences between young, middle-aged, and older workers. For workers between 25 and 34, almost all variables are

significant or approaching significance, and for the variables in Table 9.2 all of the variables have negative coefficients for disabled individuals. This result implies that ALMP spending, sheltered employment, and commitments to disability-specific policies all reduce the employment likelihood of disabled workers, the opposite of their stated goals. In particular, the disability-specific programmes ("pesra" measure) benefits able-bodied workers but hurts disabled individuals. It could be argued that this result is susceptible to reverse endogeneity, and that the countries with the worst gaps use these institutions to try and solve their employment problem. Moreover, if there is more demand for these services, naturally expenditure would increase. However, given the lack of nations measuring disability employment rates, it seems implausible that the governments would then be targeting resources in response to a widening gap. While reverse endogeneity cannot be completely ruled out, this result suggests that these programmes are ineffective, or worse are diverting resources away from the disabled individuals they are meant to be supporting.

The second two demographic divisions by gender and education level do not show as much variance in effect as between age brackets. For the union variables concerning disability, excess coverage appears more important for males with disabilities. This may be due to unions with greater bargaining power but fewer members concentrating the benefits on their traditional constituency, male workers. Interestingly, crisis appears to result in greater employment for females and a loss for males and this effect is strongest for those with disabilities. This can reflect the greater participation of women as part of the historical trend, or household finances requiring one group to make up a loss in employment in the other group.

Benefit generosity does have a different impact between able-bodied and disabled individuals of higher education, which is unexpected. This is unexpected as whilst benefit generosity measures disability benefits, most nations have a relatively consistent level of benefits they pay – unemployment insurance will likely be high also in a high DI country. Therefore, the "bengen" measure is likely to correlate with benefits elsewhere in the welfare state. The impact varies little between high and low educated individuals with disability is counter to what is seen with able-bodied individuals. The expectation is that high educated individuals are less attracted by welfare transfers as their earning potential is higher from their higher human capital. Their wage offers would have a distribution far above the level where benefit transfers would have an impact on a reservation wage strategy. This result implies that there may be specific mechanism between benefit generosity and disability different from the standard economic explanation of income and substitution effects. This will be explored in more depth in the discussion section. It is interesting that the excess coverage measure is significant for high educated people with disabilities. It would be expected that union variables benefit the skilled labour classes the most, and the professional classes the least. This could

potentially be due to workers with disabilities facing pay penalties for their conditions, and union bargaining has the effect of increasing wage equality overall. Higher wages will then incentivise greater participation by people with disabilities. This would support the theory of monopsonistic markets, whereby individuals with lower wage elasticity suffer from wage discrimination and this depresses overall labour participation. However, this is not found for union density, which implies this may be an effect that is only present at the macro-level, when bargaining involves deals spread across the whole economy.

*Table 9.1 Results of the micro-data model, testing the effects of institutions on the employment of able-bodied and disabled individuals in different demographic groups.*

| | Disabled | EPL sum | | Benefit generosity | | Excess coverage | | Union density | |
|---|---|---|---|---|---|---|---|---|---|
| **Disabled** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| **Total** | **-0.21317** | -0.03938 | **-0.06560** | **0.00880** | **0.01186** | 0.00056 | **0.00132** | 0.00092 | 0.00102 |
| (175,343) | (-2.60) | (-1.58) | (-2.07) | (2.70) | (2.44) | (1.08) | (2.50) | (1.69) | (1.31) |
| **15-24** | **-0.22760** | **-0.09930** | -0.00620 | **0.00862** | **0.01197** | **0.00165** | -0.00034 | -0.00028 | -0.00086 |
| (21,723) | (-2.81) | (-2.29) | (-0.18) | (1.85) | (3.56) | (1.91) | (-0.39) | (-0.34) | (-1.32) |
| **25-34** | -0.13332 | 0.01421 | 0.01448 | **0.00765** | **0.00764** | 0.00037 | **0.00116** | **0.00087** | 0.00060 |
| (34,637) | (-1.52) | (0.60) | (0.67) | (3.15) | (2.07) | (0.65) | (4.44) | (2.15) | (1.12) |
| **35-44** | -0.11015 | 0.00180 | -0.02079 | 0.00222 | 0.00288 | 0.00047 | **0.00116** | **0.00125** | 0.00117 |
| (40,824) | (-1.47) | (0.08) | (-0.59) | (0.64) | (0.54) | (0.88) | (2.18) | (2.81) | (1.50) |
| **45-54** | **-0.27596** | **-0.05389** | **-0.09091** | 0.00076 | 0.00777 | **0.00092** | **0.00221** | **0.00175** | **0.00150** |
| (40,090) | (-2.52) | (-1.89) | (-2.10) | (0.16) | (1.18) | (1.81) | (3.05) | (2.78) | (1.72) |
| **55-64** | **-0.23237** | **-0.09489** | **-0.11107** | **0.02230** | **0.02031** | -0.00049 | 0.00093 | 0.00118 | 0.00114 |
| (38,019) | (-2.90) | (-1.95) | (-2.22) | (3.85) | (3.17) | (-0.42) | (1.13) | (0.90) | (0.92) |
| **Male** | **-0.30687** | **-0.03911** | **-0.05854** | **0.00739** | **0.01349** | 0.00059 | **0.00177** | 0.00027 | 0.00061 |
| (84,000) | (-3.32) | (-2.04) | (-1.80) | (2.63) | (2.55) | (1.31) | (2.98) | (0.64) | (0.77) |
| **Female** | **-0.14126** | -0.03920 | **-0.06861** | **0.00993** | **0.01157** | 0.00050 | **0.00100** | **0.00155** | 0.00131 |
| (91,310) | (-1.78) | (-1.22) | (-2.15) | (2.63) | (2.51) | (0.83) | (1.85) | (2.25) | (1.62) |
| **High Education** | **-0.28014** | -0.00720 | 0.01008 | **0.00796** | **0.01310** | 0.00060 | **0.00109** | 0.00067 | 0.00004 |
| (76,365) | (-4.49) | (-0.30) | (0.33) | (2.39) | (3.31) | (1.00) | (2.54) | (1.13) | (0.06) |
| **Low education** | **-0.29475** | -0.06423 | -0.03903 | **0.01281** | **0.01447** | 0.00089 | 0.00020 | 0.00054 | -0.00083 |
| (62,173) | (-2.82) | (-1.63) | (-0.86) | (2.96) | (2.24) | (1.21) | (0.25) | (0.44) | (-0.86) |

*Note:* T values are in parentheses, and all results significant at the 90% level or higher are highlighted in bold. Number of observations is the figure in brackets below each demographic group. All coefficients are reported to 5 decimal places.

*Table 9.2 Results of the micro-data model, testing the effects of institutions on the employment of able-bodied and disabled individuals in different demographic groups.*

| | ALMP expenditure | | Sheltered employ. | | UN CRPD | | PESRA | | Post-crisis | | cons |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Disabled** | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | |
| **Total** | -0.03013 | -0.02185 | -0.01561 | -0.02097 | -0.01135 | -0.00532 | 0.00455 | -0.00801 | -0.00233 | 0.02046 | **0.68936** |
| (175,343) | (-0.68) | (-0.55) | (-1.07 | (-0.94) | (-0.43) | (-0.19) | (0.42) | (-0.32) | (-0.16) | (1.38) | (10.41) |
| **15-24** | 0.00438 | -0.01729 | -0.02380 | -0.01858 | -0.04497 | -0.00449 | 0.00366 | 0.00154 | **-0.06386** | -0.02965 | **0.56322** |
| (21,723) | (0.07) | (-0.33) | (-1.15 | (-0.84) | (-1.05) | (-0.14) | (0.32) | (0.06) | (-3.03) | (-0.93) | (5.68) |
| **25-34** | **-0.08343** | -0.04030 | **-0.01660** | -0.02299 | -0.03220 | **-0.03391** | **0.02017** | -0.02428 | -0.01160 | **-0.02535** | **0.68334** |
| (34,637) | (-2.40) | (-1.50) | (-1.73 | (-1.64) | (-1.50) | (-2.15) | (2.89) | (-1.66) | (-0.75) | (-2.15) | (15.34) |
| **35-44** | -0.02078 | -0.02629 | -0.01134 | -0.03186 | -0.00291 | 0.02028 | -0.00452 | -0.03780 | -0.00458 | -0.01688 | **0.78390** |
| (40,824) | (-0.45) | (-0.65) | (-0.73 | (-1.24) | (-0.11) | (0.84) | (-0.35) | (-1.62) | (-0.34) | (-0.84) | (12.80) |
| **45-54** | -0.02757 | -0.01009 | -0.02012 | -0.02895 | 0.00384 | -0.00385 | -0.00027 | -0.02335 | 0.01618 | **0.03902** | **0.90305** |
| (40,090) | (-0.59) | (-0.23) | (-0.89 | (-0.89) | (0.12) | (-0.10) | (-0.01) | (-0.80) | (1.24) | (2.16) | (9.77) |
| **55-64** | -0.00872 | -0.01629 | -0.00833 | 0.00164 | -0.00753 | -0.00145 | 0.00260 | 0.00758 | **0.06600** | **0.06639** | **0.49783** |
| (38,019) | (-0.11) | (-0.27) | (-0.27 | (0.06) | (-0.16) | (-0.04) | (0.09) | (0.24) | (3.30) | (3.32) | (4.32) |
| **Male** | -0.02066 | -0.00667 | -0.00885 | -0.00741 | -0.02637 | -0.01678 | 0.00218 | -0.01168 | -0.02896 | -0.00494 | **0.80211** |
| (84,000) | (-0.49) | (-0.17) | (-0.70 | (-0.38) | (-1.21) | (-0.64) | (0.27) | (-0.50) | (-1.70) | (-0.30) | (15.45) |
| **Female** | -0.04220 | -0.03189 | -0.02247 | -0.02905 | 0.00638 | 0.00303 | 0.00784 | -0.00573 | **0.02386** | **0.04125** | **0.58049** |
| (91,310) | (-0.87) | (-0.76) | (-1.33 | (-1.18) | (0.21) | (0.10) | (0.53) | (-0.21) | (1.90) | (2.67) | (7.06) |
| **High Education** | -0.02709 | -0.02289 | -0.01866 | 0.00331 | -0.02649 | 0.00814 | -0.00653 | -0.00934 | -0.00146 | 0.00463 | **0.69430** |
| (76,365) | (-0.63) | (-0.70) | (-1.17 | (0.17) | (-1.13) | (0.34) | (-0.53) | (-0.45) | (-0.09) | (0.27) | (8.74) |
| **Low education** | -0.00475 | 0.04540 | -0.02626 | -0.03247 | -0.02597 | -0.04422 | **0.02959** | 0.02888 | -0.01147 | 0.02271 | **0.61223** |
| (62,173) | (-0.08) | (0.94) | (-1.27 | (-1.21) | (-0.88) | (-1.19) | (2.00) | (1.02) | (-0.49) | (1.16) | (5.93)3 |

*Note:* T values are below the coefficients, and all results significant at the 90% level or higher are highlighted in bold. Number of observations is the figure in brackets below each demographic group. All coefficients are reported to 5 decimal places.

**Adding interactions between institutions**

The macro-analysis results found the benefit generosity-activation interaction to be the most significant relationship between institutions, and so the micro-analysis will focus on this relationship. The results are reported in Table 10.1 and 10.2, and set out in the same way as with the institution alone micro-analysis. The significance of the benefit generosity-activation interaction is apparent – it boosts employment for all groups except one to a very significant level, and for both able-bodied and people with disabilities. This reflects the results of the macro-analysis and the categorisation exercise, where the Nordic nations are well known for their high employment focus. This result is consistent with the search theory model used for this paper. As detailed above, higher benefit generosity counteracts the higher cost to job searching from activation. But importantly, the activation focus leads to a higher job offer rate (due to increasing the efficiency of job search), and so higher employment levels. Once this relationship is controlled for, the benefit generosity measure becomes negative, countering one of the more puzzling results from the first macro-analysis. Moreover, including this relationship controls for the country clusters identified by the categorisation exercise, and justifies testing for any other significant changes in the effect of institutions.

The interaction analysis shows that the three key institutions for impacting employment rates are EPL, benefit generosity, and excess coverage. For EPL, the negative effect is significant for disabled workers, and the age brackets show that this is most important for older disabled individuals and broadly insignificant for able-bodied individuals. Benefit generosity is not significant for individuals with disabilities. This result is very interesting, given that conventional economic theory would hold that higher benefits incentivise non-participation. A potential mechanism for why this may be the case will be explored in more depth in the discussion. Finally, excess coverage once again returns a significant positive effect on the employment rate of people with disabilities approximately double the coefficient for able-bodied individuals, contrary to expectations by search theory. Once again, the positive impact appears to be concentrated on men and individuals with higher education, whilst union density has a significant positive impact on women. There appear to be two separate mechanisms relating to unions, and this will be explored further in the discussion section.

The micro-analysis has provided greater depth to the results gained in the macro-analysis, allowing for the separation of effects between able-bodied and disabled individuals. This allowed the analysis to see whether a closing of the disability employment gap was from "levelling up" or "levelling down" – whether each measure had disproportionate benefits or costs to a certain group. The next section will summarise the results of the analysis and draw some conclusions about the implications for economic theory and for public administration policy.

*Table 10.1: Reduced results from micro-level model involving interactions between institutions, and across demographic groups*

| | Disabled | Ben gen*activation ratio | | EPL sum | | Benefit generosity | | Excess coverage | |
|---|---|---|---|---|---|---|---|---|---|
| **Disabled** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| **Total** | **-0.18438** | **0.02917** | **0.02545** | -0.02141 | **-0.05593** | **-0.00604** | -0.00266 | **0.00118** | **0.00194** |
| (175,343) | (-2.32) | (4.55) | (4.80) | (-0.98) | (-2.57) | (-2.11) | (-0.50) | (1.94) | (3.48) |
| **15-24** | **-0.16310** | **0.03223** | **0.02756** | **-0.08045** | -0.00397 | -0.00801 | -0.00603 | **0.00230** | 0.00034 |
| (21,723) | (-2.00) | (3.34) | (2.86) | (-2.09) | (-0.10) | (-1.41) | (-0.82) | (2.47) | (0.35) |
| **25-34** | -0.11355 | **0.01870** | 0.01048 | 0.02516 | 0.01687 | -0.00185 | 0.00128 | 0.00078 | **0.00141** |
| (34,637) | (-1.24) | (3.55) | (1.40) | (1.08) | (0.72) | (-0.59) | (0.19) | (1.37) | (4.63) |
| **35-44** | -0.07767 | **0.02673** | **0.02698** | 0.01959 | -0.00881 | **-0.01130** | **-0.01280** | **0.00102** | **0.00178** |
| (40,824) | (-1.15) | (3.41) | (3.16) | (0.94) | (-0.29) | (-3.23) | (-2.07) | (1.76) | (3.76) |
| **45-54** | **-0.24529** | **0.03407** | **0.02779** | -0.03232 | **-0.07918** | **-0.01639** | -0.00765 | **0.00165** | **0.00289** |
| (40,090) | (-2.30) | (4.44) | (3.94) | (-1.35) | (-2.34) | (-3.99) | (-1.03) | (2.69) | (4.18) |
| **55-64** | **-0.21029** | **0.04002** | **0.03086** | -0.07172 | **-0.09809** | 0.00171 | 0.00352 | 0.00039 | **0.00173** |
| (38,019) | (-2.50) | (4.66) | (3.93) | (-1.64) | (-2.65) | (0.27) | (0.50) | (0.31) | (1.92) |
| **Male** | **-0.26976** | **0.02616** | **0.02873** | -0.02296 | **-0.04918** | **-0.00601** | -0.00323 | **0.00115** | **0.00245** |
| (84,000) | (-3.19) | (4.09) | (5.11) | (-1.24) | (-2.48) | (-2.29) | (-0.59) | (2.12) | (4.43) |
| **Female** | -0.11735 | **0.03174** | **0.02287** | -0.01968 | **-0.05893** | **-0.00610** | -0.00127 | 0.00117 | **0.00157** |
| (91,310) | (-1.51) | (4.92) | (4.08) | (-0.71) | (-2.43) | (-1.88) | (-0.23) | (1.72) | (2.50) |
| **High Education** | **-0.21269** | **0.02566** | **0.02380** | 0.00928 | 0.00990 | **-0.00649** | -0.00347 | **0.00118** | **0.00175** |
| (76,365) | (-3.45) | (5.03) | (5.72) | (0.45) | (0.66) | (-2.23) | (-0.93) | (2.02) | (4.10) |
| **Low education** | **-0.24585** | **0.03755** | **0.02758** | -0.03242 | -0.02084 | -0.00381 | 0.00044 | **0.00175** | 0.00094 |
| (62,173) | (-2.51) | (3.73) | (4.11) | (-1.05) | (-0.63) | (-0.99) | (0.06) | (2.44) | (1.24) |

Note: T values are below the coefficients, and all results significant at the 90% level or higher are highlighted in bold. Number of observations is the figure in brackets below each demographic group. All coefficients are reported to 5 decimal places.

*Table 10.2: Reduced results from micro-level model involving interactions between institutions, and across demographic groups*

| | Union density | | ALMP expenditure | | Sheltered employment | | UN CRPD | | PESRA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Disabled** | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| **Total** | **0.00093** | **0.00119** | -0.04722 | -0.03961 | **-0.01888** | -0.02864 | -0.00934 | -0.00199 | -0.00200 | -0.01383 |
| (175,343) | (2.40) | (1.89) | (-1.36) | (-1.08) | (-2.13) | (-1.48) | (-0.48) | (-0.07) | (-0.20) | (-0.61) |
| **15-24** | -0.00023 | -0.00057 | -0.01626 | -0.03330 | -0.02808 | -0.02909 | -0.04557 | -0.00195 | -0.00187 | -0.00258 |
| (21,723) | (-0.40) | (-0.79) | (-0.31) | (-0.68) | (-1.34) | (-1.19) | (-1.18) | (-0.05) | (-0.14) | (-0.10) |
| **25-34** | **0.00086** | 0.00067 | **-0.09298** | -0.04660 | **-0.01875** | **-0.02622** | -0.03113 | **-0.03233** | **0.01547** | **-0.02632** |
| (34,637) | (2.09) | (1.07) | (-3.29) | (-1.52) | (-1.94) | (-1.77) | (-1.58) | (-1.88) | (1.97) | (-2.03) |
| **35-44** | **0.00123** | **0.00128** | -0.03433 | -0.04062 | -0.01417 | **-0.03958** | -0.00073 | 0.02377 | -0.01148 | **-0.04473** |
| (40,824) | (3.32) | (1.96) | (-0.87) | (-1.10) | (-1.27) | (-1.76) | (-0.04) | (1.04) | (-1.27) | (-2.56) |
| **45-54** | **0.00180** | **0.00169** | -0.05093 | -0.03034 | -0.02332 | -0.03661 | 0.00717 | -0.00244 | -0.00784 | -0.03041 |
| (40,090) | (4.14) | (2.40) | (-1.33) | (-0.66) | (-1.50) | (-1.26) | (0.34) | (-0.06) | (-0.57) | (-1.15) |
| **55-64** | 0.00123 | 0.00138 | -0.03358 | -0.04252 | -0.01327 | -0.00794 | -0.00265 | 0.00484 | -0.00491 | 0.00073 |
| (38,019) | (1.11) | (1.39) | (-0.51) | (-0.77) | (-0.60) | (-0.34) | (-0.07) | (0.13) | (-0.16) | (0.02) |
| **Male** | 0.00026 | 0.00084 | -0.03563 | -0.02546 | -0.01194 | -0.01708 | -0.02398 | -0.01474 | -0.00393 | -0.01810 |
| (84,000) | (0.71) | (1.56) | (-1.05) | (-0.74) | (-1.39) | (-1.09) | (-1.46) | (-0.61) | (-0.42) | (-0.90) |
| **Female** | **0.00158** | **0.00143** | -0.06124 | -0.04862 | **-0.02585** | -0.03535 | 0.00788 | 0.00712 | 0.00097 | -0.01106 |
| (91,310) | (3.54) | (1.99) | (-1.65) | (-1.21) | (-2.54) | (-1.60) | (0.36) | (0.24) | (0.08) | (-0.44) |
| **High Education** | 0.00060 | 0.00021 | -0.03566 | -0.03447 | **-0.01870** | -0.00576 | -0.02028 | 0.01372 | -0.01390 | -0.01635 |
| (76,365) | (1.46) | (0.48) | (-1.16) | (-1.30) | (-2.13) | (-0.39) | (-1.06) | (0.58) | (-1.54) | (-0.84) |
| **Low education** | 0.00053 | -0.00080 | -0.02968 | 0.02871 | **-0.02158** | -0.03235 | -0.01265 | -0.03644 | **0.02202** | 0.02263 |
| (62,173) | (0.59) | (-1.09) | (-0.63) | (0.62) | (-1.76) | (-1.50) | (-0.51) | (-1.01) | (1.86) | (0.87) |

Note: T values are below the coefficients, and all results significant at the 90% level or higher are highlighted in bold. Number of observations is the figure in brackets below each demographic group. All coefficients are reported to 5 decimal places.

## V. Discussion and conclusion

The results of the macro-level and micro-level analyses have supported earlier expectations based on the model of search theory and monopsonistic labour markets in some areas, but lead to counterintuitive results in others that warrant further examination. The discussion section will focus on the economic model of this paper and highlight whether it is able to explain the results found and what alternative mechanisms could be present. Each of the variables will be summarised in turn, then the limitations of the research will be examined, leading to some final concluding remarks. Further areas for research and policy recommendations will be suggested at relevant points throughout the section. Finally, the conclusion will bring together the issues and examined and analyse the implications for public administration in practice.

Employment protection legislation is held to impact the rate of job offers in search theory due to such legislation increasing the cost of firing, and therefore also hiring, new workers. Under search theory, the rate of job offers need not be constant for all groups and therefore certain groups on the margins of the labour market can suffer greater frictions. Disabled workers have a reduced number of jobs that they can productively fill and concerns over productivity can reduce job offers. The macro-analysis found EPL to consistently increase the disability employment gap, the micro-analysis showed that EPL reduced the employment rates of people with disabilities whilst the effect on able-bodied individuals was not significant. This effect appears strongest for women and older workers with disabilities. These workers are probably more likely to be in lower-skilled, part-time work, due to desires to reduce work commitments or employers potentially viewing these workers as higher risk due to their closeness to retirement or expectations to drop out the workforce. Overall, the results of the analysis provide evidence to support hypothesis 2, that EPL harms the employment prospects of individuals with disabilities. This supports the validity of search theory in explaining the impact of increased costs-to-firing and that this has a greater impact on workers with lower job offer rates. There may be restrictive legislation around low skilled part-time work with the intention of pushing employers towards permanent contracts and greater job security, but this can result in just fewer employment opportunities rather than better work.

Benefit generosity is frequently cited as leading workers to choose to withdraw from the labour market and rely on transfers, and evidence was somewhat mixed across the results. When controlling for interactions between generosity and activation, the higher generosity non-participation incentive was found, but at the micro-level the effect was not significant on disabled workers. Conventional economic theory struggles to explain this result. A mechanism of why people with disabilities may face a weaker non-participation incentive is one the author credits to UK charities

campaigning against disability welfare reductions since 2010 (see Disability Benefits Consortium, 2017). Individuals with disabilities face extra costs in their daily lives due to those disabilities, such as increased mobility costs and healthcare needs. Often disability is caused by or accompanied with an illness or long-term condition that can fluctuate in severity over time, and therefore how much it impairs an individual's ability to carry out functions either personal or professional. Prompt and sufficient payment of welfare transfers ensures that disabled individuals can seek the healthcare they need, reduce psychological strain regarding their financial situation, and reduce the isolation their condition can bring. If the individual can meet these needs, they are more likely to be able to manage their condition and be able to return to work. Search theory is able to incorporate this result better than neoclassical approaches. Disabled workers face a greater cost to job search, and generally a higher cost to employment with their increased healthcare needs. The higher benefits provide less of an incentive to non-participation in the workforce, as the additional income from these transfers allows for the cost of more rounds of job searching to be completed before discouragement takes hold. The mechanism may also be similar to education, whereby an upfront investment in period t increases employment prospects in period t+1, with medical conditions effectively treated. This may have the effect of lowering the cost of job searches in future periods. Interestingly, low education individuals appear the least incentivised by high benefits, and even have a positive coefficient (albeit not significant as well). Therefore, hypothesis 3 is partially supported; activation and generosity lead to higher employment outcomes, but high generosity has not been found to create a significant disincentive to work for all people with disabilities. Moreover, search theory is able to better explain this result than neoclassical economic theory, as lower education (and therefore likely lower income) individuals appear least incentivised which is best explained by cost to job searching mechanisms. Whether this is an anomalous result or an indication that the disability charities cited above have a credible economic argument should be the subject of future research.

The union variables unexpectedly appeared to have a positive employment effect for disabled individuals in both analyses, which implies other effects dominate the theorised excess coverage mechanism. In the macro-analysis, excess union coverage was found to have a roughly similar standardised coefficient as EPL levels. Under the micro-analysis, excess coverage and union density seem to have a greater impact on males with disabilities and females with disabilities respectively. As mentioned in the results section, the excess coverage result could reflect unions concentrating on their traditional core constituency, men. The union density result could reflect higher membership meaning more women are involved in the decision-making process, and therefore their needs are better met. Search theory struggles to explain union effects, as it is more focused on the individual. An explanation as to why unions broadly boost the employment of the disabled to a greater degree

than able-bodied individuals can be found in the model's inclusion of monopsonistic labour markets. Unions create a level of wage equality, and prevent firms from adjusting wages to the individual worker's preferences. This higher, more equal wage level means those workers with lower wage elasticity, which disabled individuals are held to be, incentivises greater participation through higher ages. Rather than ignoring the needs of outsiders as theorised earlier, more powerful or more populous unions could represent a greater bulwark against discrimination against workers by employers. Furthermore, this does not undermine the validity of the model compared to neoclassical economic theory. This paper's expectation was that the individual level, impacting the job search equation, would be most important, when it was the interaction at the macro-level environment and monopsonistic markets that appears to be the dominant factor. The results of the analysis cause us to reject hypothesis 1 that excess coverage would lead to lower employment rates for people with disabilities.

The effect of ALMPs, whether generally or disability-specific, to boost employment was mixed and efficacy is most likely related to the individual programmes on a national level. As described in the theory section, evaluations of ALMPs have frequently found mixed results (see Card, Kluve & Weber, 2015). An explanation is the complexity of ALMPs compared to passive programmes such as unemployment insurance. The latter consists of a conditional transfer, and the focus is on the replacement rate and duration of the benefit. ALMPs consist of much more complex elements, such as the content of the programme, how many staff are required (and their competency), the skills being taught, or many other factors. In addition, the mix of ALMP programmes changes over time. This nuance is poorly captured by aggregated measures and this can lead to a lot of measurement noise. However, the analysis can help address one hypothesis drawn from the theory. The sheltered employment variable was found to reduce the disability employment gap at the macro-level, but this was found at the micro-analysis to be due to reducing the employment prospects of able-bodied workers at a greater level than disabled for the interaction between ALMPs and sheltered employment. One mechanism may be that the programme is so poorly targeted that most of the participants are not even the target group. Another may be that it is a proxy for inefficient public employment, which would be in accordance with Sayce's (2011) finding that such schemes were vastly more expensive than alternatives. This would be in line with the significant, negative interaction coefficient which implies that the more ALMP spending is based on sheltered employment, the worse the employment outcomes are for able and disabled individuals. This would lead to a crowding out effect of more effective ALMPs, and broadly finds that ALMPs are ineffective at increasing the matching process. As mentioned above, this doesn't provide a serious challenge to search theory due to the heterogeneity of ALMPs included under the aggregate measures, but it may

suggest that trying to boost the efficiency of the matching process is difficult as a public policy goal. The model would be improved through better understanding of how and why ALMPs do not appear to increase matching efficiency, even if broadly "activation" seems to increase employment in conjunction with high benefit generosity. The results support hypothesis 6, that investing in sheltered employment is not an efficient expenditure by governments and could be leading to crowding out. A final remark is that this result could be obscuring a change between sheltered and supported employment over the period of examination, and therefore analysis with access to better data would be useful in uncovering these effects.

The failure of disability-specific programmes and conventions to promote employment of disabled individuals was a surprising result, but not totally unexpected given the earlier research on the Americans with Disabilities Act. The variable measuring UN CRPD alone was found to either have no significant effect or to increase employment for able-bodied individuals. This result is likely down to the variable representing a poor proxy for government commitment to accountability. It could equally be the case that governments with strong domestic institutions, such as an independent judiciary, have no need for supra-national treaties to hold them accountable for their actions to their citizens with disabilities and so the treaty was merely duplication. However, that disability-specific public employment services and dedicated authorities for ensuring reasonable accommodations are made for disabled were associated with greater labour market exclusions for disabled individuals is perplexing. The presence of such programmes and authorities led to increased employment for able-bodied individuals and worse employment for disabled, implying that these programmes affect groups differently. There may be a serious failure in targeting resources effectively, with able-bodied individuals crowding out disabled individuals in demands for resources. Equally, such programmes may simply be ineffective or tokenistic. Disability-specific programmes may be a convenient rug to sweep difficult cases under, rather than an improved offering over conventional employment programmes. On the evidence from the analysis, hypothesis 5 broadly speaking must be rejected as the positive employment effects are not felt by people with disabilities.

The UN CRPD and "pesra" result could provide evidence against the theory of monopsonistic labour markets as it appears legislation to reduce wage inequality and imposing responsibilities to provide adaptations harmed employment rates. However, this conclusion may be premature. Given that all EU states offer some form of state funding for unreasonable accommodations (in terms of cost), dedicated public authorities could represent the wrong body to be tasked with carrying out this function. Considering the union variables increase disability employment in the results, this would suggest that outsourcing the responsibilities of compliance with and funding of accommodations for disabled individuals to unions could prove successful. As an institution, unions are far closer to the

needs and preferences of the workers they represent than some government authorities. European nations have successfully tasked unions before with the provision of labour market programmes such as unemployment insurance. Given that the theorised union mechanism above is evidence for monopsonistic markets, the results for antidiscrimination may reflect poor execution rather than support neoclassical economic theory but firm conclusions cannot be drawn. The result of this analysis suggests that policy-makers should seek to pilot an outsourcing of these additional responsibilities to meet the needs of disabled workers within the workplace, and this would provide additional insight on the validity of monopsonistic labour markets.

To sum up the discussion, the results have reinforced conventional understanding of some labour market institutions and provided new insight on how people with disabilities can be impacted differently by those same institutions. There are some variables, such as ALMPs and the disability-specific programmes, where the insignificant results hamper the ability to draw firm conclusions. But for the institutions found to be most significant, EPL, benefit generosity, and unions, the model provides plausible mechanisms as to why people with disabilities face greater barriers to employment compared to their able-bodied colleagues. The benefit generosity-activation interaction was in line with expectations and supported the categorisation exercise, with high benefit generosity and activation leading to better employment outcomes. This result supports the validity of the model including search theory in explaining labour markets, with the cost of activation and greater ability to bear that cost through additional income. The insignificant effect of benefit generosity on the employment of people with disabilities was a very interesting finding, even though the coefficient was negative. This implies that conventional economic thinking may be missing additional nuance for people with disabilities, which is crucial for deciding the optimal benefit generosity level. It was interesting to find that contrary to Belot & van Ours (2004), the addition of interactions increased the significance of the institutional variables rather than reducing them. Whether this is due to the focus on one segment of the labour market, people with disabilities, or some other factor would be an interesting avenue to pursue in future research. In sum, the model of search theory and monopsonistic labour markets convincingly explain the effect of different institutions, with their focus on the individual and the aggregate levels respectively.

**Limitations**

The lack of research and focus on disability was the motivation for the research and constitutes the main limitation in uncovering detailed insight into the research question. Unemployment rates are frequently gathered by almost all nations, but the disability employment statistics on the Eurostat

database at the time of writing are based off one Labour Force Survey ad hoc module from 2011. The author is only aware of one country, the UK, that targets and measures the disability employment gap as part of its labour force statistics. This is symbolic of the limitations uncovered during the data gathering period for the research, and required using the ESS, a social attitudes survey, as a method to calculate economic employment rates. Other limitations on data availability are not always disability-specific. For example, in the OECD data, at the time of writing the ALMP expenditure data for the UK has been blank since 2011. Moreover, the separation of different programmes makes the isolation of their effects difficult. Under the OECD data again, sheltered and supported employment are grouped together as an aggregate expenditure despite the former being broadly regarded as inefficient but the latter recommended by the European Commission (2011). Improvement in data gathering and recording in these areas will allow for greater insight into what works. But this must also be accompanied by a focus by nations on the impact of these programmes on specific groups such as people with disabilities.

A second limitation is the time and linguistic ability of the author in conducting the research. Europe provides an interesting group of nations with broad enough similarity to compare but also enough variation to draw conclusions. However, to examine the labour market regimes in detail requires significant knowledge of each government policy approach and programmes, which simply is not possible in the short time frame. Analysis of government documents required linguistic skills not available at short notice. Therefore, analysis of the different labour market regime relied on EU documents and reports that provided useful insight and summaries of the subjects being examined. However, this left the research potentially exposed to the biases of the authors of those reports, and one step further removed from the expertise on these subjects. Given more time, the research would be enhanced by contacting relevant experts in the labour market regimes of each of the nations under examination and conducting a more thorough classification of the different programmes.

The research suffers from limitations in scope, both from its broadness and its narrow focus on European nations. As noted earlier, if expenditure on a certain type of programme does not necessarily translate into efficacy that could be due to an inefficient implementation of an approach rather than a failure in the approach itself. Sheltered employment may have been evaluated as ineffective in the UK by Sayce (2011), but it may be much more efficient in Poland for example. The broad approach taken by this research can result in nuance being lost. A second limitation in scope is the focus on European nations. There are many OECD nations who could plausibly warrant analysis under the framework adopted in the analyses with developed labour market institutions and workforces containing significant numbers of disabled individuals. The analysis above may not hold for North America, or the Antipodean states. These countries were not included because the data

gathering issues would have been exacerbated, and with no EU documentation to provide overviews it would have been too much for this situation. But future research should seek to expand the focus wider than Europe.

## Conclusion

The prevalence of disability is increasing across developed nations, and as the age of the workforce increases due to demographic change governments will have to increasingly ensure that their labour markets remain open to individuals with disabilities. However, what is needed to keep these individuals in the labour force and people working longer more generally is poorly understood. Labour market institutions play a significant role in the employment rates across labour markets, but previous analysis has only focused on the labour market as a whole. This analysis adds to the public administration and economics literature by giving some indication as to which labour market institutions have the greatest impact on this increasing segment of the labour force.

Firstly, employment protection legislation appears to inflict extra frictions on job searches that disproportionately impact people with disabilities. Whilst the impact is small, it also appears to affect women whether disabled or able-bodied, which is another key demographic that governments are seeking to increase the participation rate of. Flexible working is being championed in nations such as Denmark with their flexicurity model, and this approach appears to be suitable for people with disabilities as well. The other side of the flexicurity model is high benefit generosity, which is generally held to incentivise non-participation. However, this research has shown that when combined with an activation focus, employment rates of all workers can be increased. Activation alone appears to be a disincentive to stay attached to the labour market, and this is a significant finding for governments seeking to boost employment rates and not just reduce welfare bills. Finally, the analysis provides some support to the argument that benefit generosity should not be reduced people with disabilities as this will reduce their ability to pay for the additional costs due to disability and potentially decrease their employment prospects. The lowest earners may need the extra support to pay for healthcare needs, and that in the long term this may be a barrier to employment larger than the incentive to stop working and receive passive transfers. Governments should seek to increase access to the labour market through reducing institutional barriers such as excessive EPL, and personal barriers such as income to pay for the additional costs due to disability.

The evidence for government-led programmes that seek to help people with disabilities achieving their aims is mixed at best. Most of the results show that these disability-specific

programmes, whether reasonable accommodations authorities, sheltered employment or disability-specific public employment services, are not reaching their intended users. If the employment effect is positive, it is one felt by able-bodied individuals. If it is negative, it usually is people with disabilities that face the cost. The measures used in this analysis are far from perfect and may not reflect the necessary nuance required for a fair evaluation of these services. However, it does support the proposal that outsourcing these services to institutions such as unions may be a way to achieve better employment outcomes. The results of this paper have provided qualified support to monopsonistic labour markets, and the government legislation that worked for gender discrimination (see Manning, 1994) does not appear to have been as successful for people with disabilities. The devolution of responsibility for reducing wage discrimination could provide an alternative mechanism to ensuring that the needs of people with disabilities are met in the workplace, and reduce the administrative burden on public services. The suitability of such as policy solution will differ by country, with some nations having a large role for unions in public life and minimal role in others, but this could provide a promising solution to broadly a failure by governments to tackle disability employment issues.

The findings of this analysis have been largely in line with the evidence from other research, but goes further in demonstrating that the "one-size fits all" approach to labour market analysis ignores crucial cleavages in the labour market. Previous modelling has focused on simplicity at the expense of recognising the heterogeneity of workers. Under this paper's model, the job search function and the bargaining position of individuals in the labour market could differ, and therefore the same institution cannot be expected to have the same impact for all individuals. Future analysis must acknowledge and account for these differences, otherwise certain groups will continue to be excluded from the labour market. For many developed economies, it is no longer possible to continue excluding so many people from the labour market with the increasing demands fiscal demands on the state.

## References


Acemoglu, D., & Angrist, J. (2001). Consequences of Employment Protection? The Case of the Americans with Disabilities Act. *Journal of Political Economy 109*, No. 5, pp. 915-957.

Allan, J. S. (2004). Political Partisanship and Welfare State Reform in Advanced Industrial Societies. *American Journal of Political Science*, 48(3): pp. 496-512.

Anand, P., & Sevak, P. (2017). The role of workplace accommodations in the employment of people with disabilities. *IZA Journal of Labor Policy* , 6:12.

Armingeon, K. (2012). The Politics of Fiscal Responses to the Crisis of 2008–2009. *Governance* , 25(4), pp. 543-565 .

Arts, W., & Gelissen, J. (2002). Three Worlds of Welfare Capitalism or More? A State-of-the-Art Report. *Journal of European Social Policy*, Vol. 12, Issue 2, pp. 137-158.

Autor, D., & Duggan, M. (2006). The Growth in the Social Security Disability Rolls: A Fiscal Crisis Unfolding. *Journal of Economic Perspectives*, Vol. 20, No 6, pp. 71-96.

Backman, C. (2004). Employment and work disability in rheumatoid arthritis. *Current Opinion in Rheumatology*, Volume 16 - Issue 2 - p 148-152.

Belot, M., & Van Ours, J. (2004). Does the recent success of some OECD countries in lowering their unemployment rates lie in the clever design of their labor market reforms? *Oxford Economic Papers*, 56 (4), pp 621-642.

Benitez-Silva, H., & Heiland, F. (2008). Early Claiming of Social Security Benefits and Labour Supply Behaviour of Older Americans. *Applied Economics*, 40(23); pp. 2969-2985.

Birsch, B., & Jahn, E. (2015). Is There Monopsonistic Discrimination against Immigrants? First Evidence from Linked Employer-Employee Data. *Industrial and Labor Relations Review*, 68 (3), 501-528.

Blanchard, O., & Wolfers. (2001). The Role of Shocks and Institutions in the Rise of European Unemployment: the Aggregate Evidence. *The Economic Journal*, 110(462): pp. 1-33.

Boeri, T., & van Ours, J. (2013). *The Economics of Imperfect Labour Markets.* Princeton: Princeton University Press.

Bond, G., Drake, R., & Becker, D. (2008). An Update on Randomized Controlled Trials of Evidence-Based Supported Employment. *Psychiatric Rehabilitation Journal*, Vol 31(4), pp. 280-290.

Boyle, M., & Lahey, J. (2010). Health Insurance and the Labor Supply Decisions of Older Workers: Evidence from a U.S. Department of Veterans Affairs Expansion. *Journal of Public Economics*, 94; 467-478. .

Burkhauser, R., & Daly, M. (2011). *The Decline Work and Welfare of People with Disabilities: What Went Wrong and a Strategy for Change.* Washington DC: American Enterprise Institute Press.

Burkhauser, R., Butler, S., & Kim, Y. (1995). The Importance of Employer Accommodation on the Job Duration of Workers with Disabilities: A Hazard Model Approach. *Labour Economics*, Volume 2, Issue 2, pp. 109-130.

Campolieti, M. (2004). The Correlates of Accommodations for Permanently Disabled Workers. *Industrial Relations*, Volume 43, Issue 3, pp. 546-572.

Campolieti, M. (2005). How Accommodations Affect the Duration of Post-Injury Employment Spells. *Journal of Labor Research*, Volume 26, Issue 3, pp 485–499.

Card, D., Kluve, J., & Weber, A. (2015). What Works? A Meta Analysis of Recent Active Labor Market Program Evaluations. *IZA Discussion Paper No. 9236*.

Cimera, R. (2008). The Cost-Trends of Supported Employment Versus Sheltered Employment. *Journal of Vocational Rehabilitation*, Vol. 28, no. 1, pp. 15-20.

Coalition for Inclusion. (2012, September 25). *Position Paper on the CRPD Ratification Process in the Netherlands: Unwilling or Just Really Slow?* Retrieved May 30, 2018, from www.vnverdragwaarmaken.nl: http://www.vnverdragwaarmaken.nl/vnverdragwaarmaken/images/vnhome/Position_paper_to_MrsPillay_on_the_CRPD_in_the_Netherlands_sept_25_2012.pdf

Croezen, S., Burdorf, A., & van Lenthe, F. (2016). Self-perceived health in older Europeans: Does the choice of survey matter? *Eur J Public Health*, Vol. 26 Issue 4, pp. 686-92.

Dahl, G., & Gielen, A. (2018). Intergenerational Spillovers in Disability Insurance. *IZA Discussion Papers*, No. 11334.

DeLeire, T. (2000). The Wage and Employment Effects of the Americans with Disabilities Act. *The Journal of Human Resources*, Vol. 35, No. 4, pp. 693-715.

Department for Work and Pensions. (2017). *Improving lives: the future of work, health and disability.* London: UK Government.

Disability Benefit Consortium. (2017, September 13). *Failing Benefits System Leads to Ill-Health and Isolation for Disabled People.* Retrieved May 09, 2018, from Disability Benefit Consortium: https://disabilitybenefitsconsortium.wordpress.com/2017/09/13/failing-benefits-system-leads-to-ill-health-and-isolation-for-disabled-people/

Esping-Andersen, G. (1990). *The Three Worlds of Welfare Capitalism.* Princeton University Press.

ESS. (2014, April 25). *Documentation of ESS Post-Stratification Weights.* Retrieved April 28, 2018, from European Social Survey: https://www.europeansocialsurvey.org/docs/methodology/ESS_post_stratification_weights_documentation.pdf

European Commission. (2010). European Disability Strategy 2010-2020: A Renewed Commitment to a Barrier-Free Europe. COM(2010) 636.

European Commission. (2011). *Supported Employment for People with Disabilities in the EU and EFTA-EEA: good practices and recommendations in support of a flexicurity approach.* Luxembourg: Publications Office of the European Union.

European Commission. (2013). *PES Approaches for Sustainable Activation of People with Disabilities: Analytical Paper.* DG Employment, Social Affairs and Inclusion.

European Parliament. (2015). *Reasonable Accommodation and Sheltered Workshops for People with Disabilities: Costs and Returns of Investments.* Brussels: Directorate General for Internal Policies: IP/A/EMPL/2013-03 January 2015, PE 536.295.

Eurostat. (2015). *Employment of Disabled People: Statistical Analysis of the 2011 Labour Force Survey ad hoc Module.* Luxembourg: European Union.

Geiger, B., van der Wal, K., & Tøge, A. (2017). Success and Failure in Narrowing the Disability Employment Gap: Comparing Levels and Trends Across Europe 2002–2014. *BMC Public Health*, 17:928.

Gruber, J. (2000). Disability Insurance Benefits and Labor Supply. *Journal of Political Economy* , 108 No. 6: 1162-1183.

Høgelund, J., & Holm, A. (2014). Worker Adaptation and Workplace Accommodations After the Onset of an Illness. *IZA Journal of Labor Policy*, 3:17.

Holland, K. (2018, March 13). *Ratifying UN laws on disability without appeal option 'ridiculous'.* Retrieved May 30, 2018, from Irish Times: https://www.irishtimes.com/news/social-affairs/ratifying-un-laws-on-disability-without-appeal-option-ridiculous-1.3425282

Kirsh, B., Stergiou-Kita, M., Gewurtz, R., Dawson, D., Krupa, T., Lysaght, R., & Shaw, L. (2009). From Margins to Mainstream: What do we Know About Work Integration for Persons with Brain Injury, Mental Illness and Intellectual Disability? *Work*, Vol. 32, No. 4, pp. 391-405.

Koning, P. (2005). Estimating the Impact of Experience Rating on the Inflow into Disability Insurance in the Netherlands. *Discussion Paper Series / Tjalling C. Koopmans Research Institute*, Volume 05, Issue 07.

Koning, P., & Lindeboom, M. (2015). The Rise and Fall of Disability Insurance Enrollment in the Netherlands. *Journal of Economic Perspectives*, 29 (2): 151-72.

Mankiw, G. (2012). *Principles of Economics.* Mason: South-Western Cengage Learning.

Manning, A. (1996). The Equal Pay Act as an Experiment to Test Theories of the Labour Market. *Economica*, 63(250), pp. 191-212.

Manning, A. (2003). *Monopsony in Motion: Imperfect Competition in Labour Markets.* Princeton: Princeton University Press.

Mortensen, D., & Pissarides, C. (1994). Job Creation and Job Destruction in the Theory of Unemployment. *The Review of Economic Studies*, Vol. 61, No. 3, pp. 397-415.

Mowbray, C., B. D., Harris, S., & McCrohan, N. (1995). Predictors of Work Status and Future Work Orientation in People with a Psychiatric Disability. *Psychiatric Rehabilitation Journal*, Vol 19(2), pp. 17-28.

Mullen, K., & Staubli, S. (2016). Disability Benefit Generosity and Labor Force Withdrawal. *Journal of Public Economics*, 143, 49-63.

Nickell, S. (1997). Unemployment and Labor Market Rigidities: Europe versus North America. *Journal of Economic Perspectives*, 11(3): pp. 55-74.

Nickell, S., Nunziata, L., & Wolfgang, O. (2005). Unemployment in the OECD since the 1960s: What do we know? *The Economic Journal*, Vol. 115, Issue 500, pp. 1-27.

OECD. (2003). *Transforming Disability into Ability: Policies to Promote Work and Income.* Paris: OECD.

OECD. (2010). *Sickness, Disability and Work: Breaking the Barriers: A Synthesis of Findings across OECD Countries.* Paris: OECD Publishing.

OECD. (2013). Protecting Jobs, Enhancing Flexibility: A New Look at Employment Protection Legislation. In *OECD Employment Outlook 2013* (pp. 65-126). Paris: OECD Publishing.

OECD. (2018, April 26). *OECD Statistics.* Retrieved from OECD: http://stats.oecd.org/

Pissarides, C. (2000). *Equilibrium Unemployment Theory.* Cambridge: MIT Press.

Ransom, M., & Lambson, V. (2011). Monopsony, Mobility, and Sex Differences in Pay: Missouri School Teachers. *The American Economic Review*, Vol. 101, No. 3, pp. 454-459.

Rosholm, M., & Toomet, O. (2005). A Search Model of Discouragement. *IZA Institute of Labor Economics*, IZA Discussion Paper No. 1633.

Rueda, D. (2005). Insider–Outsider Politics in Industrialized Democracies: The Challenge to Social Democratic Parties. *American Political Science Review,* Volume 99, Issue 1, pp. 61-74.

Sapir, A. (2006). Globalization and the Reform of European Social Models. *Journal of Common Market Studies*, 44(2), pp. 369-390.

Sayce, L. (2011). *Getting in, Staying in and Getting on: Disability Employment Support fit for the Future.* London: Department for Work and Pensions.

Silva, J., & Vall-Castello, J. (2012). No. 6317: Why Are So Many Disabled Individuals Not Working in Spain? A Job Search Approach. *IZA Discussion Papers*.

Staubli, S., & Zweimüller, J. (2013). Does Raising the Early Retirement Age Increase Employment of Older Workers? *Journal of Public Economics*, Volume 108, pp. 17-32.

Viser, L. (1998). Sheltered Employment for Persons with Disabilities. *International Labor Review*, Vol. 137, No. 3.

Webber, D. (2016). Firm-Level Monopsony and the Gender Pay Gap. *Industrial Relations*, 55(2), 323-345.

**Appendix 1**

Full results of the micro-level analysis including the interaction variables. Note: T values are below the coefficients, and all results significant at the 90% level or higher are highlighted in bold

| | Disabled | bengen*actrat | | EPL sum | | Benefit generosity | | Excess coverage | |
|---|---|---|---|---|---|---|---|---|---|
| **Disabled** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| **Total** | **-0.1844** | **0.02917** | **0.02545** | -0.02141 | **-0.0559** | **-0.006** | -0.00266 | **0.00118** | **0.00194** |
| (175,343) | -2.32 | 4.55 | 4.8 | -0.98 | -2.57 | -2.11 | -0.5 | 1.94 | 3.48 |
| **15-24** | **-0.1631** | **0.03223** | **0.02756** | **-0.0804** | -0.00397 | -0.00801 | -0.00603 | **0.0023** | 0.00034 |
| (21,723) | -2 | 3.34 | 2.86 | -2.09 | -0.1 | -1.41 | -0.82 | 2.47 | 0.35 |
| **25-34** | -0.11355 | **0.0187** | 0.010478 | 0.02516 | 0.016867 | -0.00185 | 0.001283 | 0.000781 | **0.00141** |
| (34,637) | -1.24 | 3.55 | 1.4 | 1.08 | 0.72 | -0.59 | 0.19 | 1.37 | 4.63 |
| **35-44** | -0.07767 | **0.02673** | **0.02698** | 0.019594 | -0.00881 | **-0.0113** | **-0.0128** | **0.00102** | **0.00178** |
| (40,824) | -1.15 | 3.41 | 3.16 | 0.94 | -0.29 | -3.23 | -2.07 | 1.76 | 3.76 |
| **45-54** | **-0.2453** | **0.03407** | **0.02779** | -0.03232 | **-0.0792** | **-0.0164** | -0.00765 | **0.00165** | **0.00289** |
| (40,090) | -2.3 | 4.44 | 3.94 | -1.35 | -2.34 | -3.99 | -1.03 | 2.69 | 4.18 |
| **55-64** | **-0.2103** | **0.04002** | **0.03086** | -0.07172 | **-0.0981** | 0.001713 | 0.003515 | 0.000389 | **0.00173** |
| (38,019) | -2.5 | 4.66 | 3.93 | -1.64 | -2.65 | 0.27 | 0.5 | 0.31 | 1.92 |
| **Male** | **-0.2698** | **0.02616** | **0.02873** | -0.02296 | **-0.0492** | **-0.006** | -0.00323 | **0.00115** | **0.00245** |
| (84,000) | -3.19 | 4.09 | 5.11 | -1.24 | -2.48 | -2.29 | -0.59 | 2.12 | 4.43 |
| **Female** | -0.11735 | **0.03174** | **0.02287** | -0.01968 | **-0.0589** | **-0.0061** | -0.00127 | 0.001165 | **0.00157** |
| (91,310) | -1.51 | 4.92 | 4.08 | -0.71 | -2.43 | -1.88 | -0.23 | 1.72 | 2.5 |
| **High Education** | **-0.2127** | **0.02566** | **0.0238** | 0.009284 | 0.01 | **-0.0065** | -0.00347 | **0.00118** | **0.00175** |
| (76,365) | -3.45 | 5.03 | 5.72 | 0.45 | 0.66 | -2.23 | -0.93 | 2.02 | 4.1 |
| **Low education** | **-0.2459** | **0.03755** | **0.02758** | -0.03242 | -0.02084 | -0.00381 | 0.000435 | **0.00175** | 0.000938 |
| (62,173) | -2.51 | 3.73 | 4.11 | -1.05 | -0.63 | -0.99 | 0.06 | 2.44 | 1.24 |

| | Union density | | ALMP expenditure | | Sheltered employment | | UN CRPD | | PESRA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Disabled** | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| **Total** | **0.00093** | **0.00119** | -0.04722 | -0.03961 | **-0.01888** | -0.02864 | -0.00934 | -0.00199 | -0.00200 | -0.01383 |
| (175,343) | 2.40 | 1.89 | -1.36 | -1.08 | -2.13 | -1.48 | -0.48 | -0.07 | -0.20 | -0.61 |
| **15-24** | -0.00023 | -0.00057 | -0.01626 | -0.03330 | -0.02808 | -0.02909 | -0.04557 | -0.00195 | -0.00187 | -0.00258 |
| (21,723) | -0.40 | -0.79 | -0.31 | -0.68 | -1.34 | -1.19 | -1.18 | -0.05 | -0.14 | -0.10 |
| **25-34** | **0.00086** | 0.00067 | **-0.09298** | -0.04660 | **-0.01875** | **-0.02622** | -0.03113 | **-0.03233** | **0.01547** | **-0.02632** |
| (34,637) | 2.09 | 1.07 | -3.29 | -1.52 | -1.94 | -1.77 | -1.58 | -1.88 | 1.97 | -2.03 |
| **35-44** | **0.00123** | **0.00128** | -0.03433 | -0.04062 | -0.01417 | **-0.03958** | -0.00073 | 0.02377 | -0.01148 | **-0.04473** |
| (40,824) | 3.32 | 1.96 | -0.87 | -1.10 | -1.27 | -1.76 | -0.04 | 1.04 | -1.27 | -2.56 |
| **45-54** | **0.00180** | **0.00169** | -0.05093 | -0.03034 | -0.02332 | -0.03661 | 0.00717 | -0.00244 | -0.00784 | -0.03041 |
| (40,090) | 4.14 | 2.40 | -1.33 | -0.66 | -1.50 | -1.26 | 0.34 | -0.06 | -0.57 | -1.15 |
| **55-64** | 0.00123 | 0.00138 | -0.03358 | -0.04252 | -0.01327 | -0.00794 | -0.00265 | 0.00484 | -0.00491 | 0.00073 |
| (38,019) | 1.11 | 1.39 | -0.51 | -0.77 | -0.60 | -0.34 | -0.07 | 0.13 | -0.16 | 0.02 |
| **Male** | 0.00026 | 0.00084 | -0.03563 | -0.02546 | -0.01194 | -0.01708 | -0.02398 | -0.01474 | -0.00393 | -0.01810 |
| (84,000) | 0.71 | 1.56 | -1.05 | -0.74 | -1.39 | -1.09 | -1.46 | -0.61 | -0.42 | -0.90 |
| **Female** | **0.00158** | **0.00143** | -0.06124 | -0.04862 | **-0.02585** | -0.03535 | 0.00788 | 0.00712 | 0.00097 | -0.01106 |
| (91,310) | 3.54 | 1.99 | -1.65 | -1.21 | -2.54 | -1.60 | 0.36 | 0.24 | 0.08 | -0.44 |
| **High Education** | 0.00060 | 0.00021 | -0.03566 | -0.03447 | **-0.01870** | -0.00576 | -0.02028 | 0.01372 | -0.01390 | -0.01635 |
| (76,365) | 1.46 | 0.48 | -1.16 | -1.30 | -2.13 | -0.39 | -1.06 | 0.58 | -1.54 | -0.84 |
| **Low education** | 0.00053 | -0.00080 | -0.02968 | 0.02871 | **-0.02158** | -0.03235 | -0.01265 | -0.03644 | **0.02202** | 0.02263 |
| (62,173) | 0.59 | -1.09 | -0.63 | 0.62 | -1.76 | -1.50 | -0.51 | -1.01 | 1.86 | 0.87 |

| | postcrisis | | cons |
|---|---|---|---|
| **Disabled** | 0 | 1 | |
| **Total** | -0.00923 | 0.00987 | **0.68155** |
| (175,343) | -0.91 | 0.73 | 13.65 |
| **15-24** | **-0.07271** | -0.04391 | **0.56163** |
| (21,723) | -4.67 | -1.55 | 6.12 |
| **25-34** | -0.01536 | **-0.02966** | **0.67905** |
| (34,637) | -1.21 | -2.33 | 14.19 |
| **35-44** | -0.01097 | -0.02758 | **0.77369** |
| (40,824) | -1.06 | -1.63 | 15.84 |
| **45-54** | 0.00775 | 0.02744 | **0.89090** |
| (40,090) | 0.74 | 1.62 | 13.43 |
| **55-64** | **0.05696** | **0.05420** | **0.48815** |
| (38,019) | 3.26 | 2.73 | 5.85 |
| **Male** | **-0.03562** | -0.01644 | **0.79607** |
| (84,000) | -2.84 | -1.18 | 17.52 |
| **Female** | 0.01695 | **0.03149** | **0.57071** |
| (91,310) | 1.63 | 2.12 | 9.55 |
| **High Education** | -0.00869 | -0.00517 | **0.69771** |
| (76,365) | -0.90 | -0.50 | 14.30 |
| **Low education** | -0.02799 | 0.00610 | **0.54547** |
| (62,173) | -1.53 | 0.30 | 7.20 |