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Substitution and spill-overs between early exit pathways in times of extending working lives in Europe

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Abstract

This article investigates to what extent instrument substitution between early exit pathways took place in Europe between 1995 and 2015. Using Eurostat aggregate data on labour market inactivity and employment rates among the population aged 55-64 in 19 European countries, we analyse substitution effects between pathways and overall spill-over effects into non-employment. In spite of a strong decline in early exit and rises in older workers' employment rates, findings suggest that instrument substitution was common especially between early retirement and disability. Reductions in early exit coincided with considerable spill-overs into non-employment, yet these spill-overs were limited when pathways contracted simultaneously.

Keywords: early retirement, disability, employment, extended working lives, Europe

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Introduction

Since the mid-1990s, there has been a growing concern in Europe that pension systems are becoming financially unsustainable in times of ageing societies and permanent austerity. To various degrees, European governments have enacted institutional reforms to keep pensions affordable. In terms of their fiscal and financial design, reforms have included shifts towards multipillar pension systems and a greater emphasis of private pension provision (Ebbinghaus, 2012). Moreover, given the low labour market participation rates among older workers in many countries, early exit has become restricted or at least made financially unattractive, while statutory retirement ages are being raised.

One of the main instruments to limit early exit from the labour market has been to close off early exit pathways. Early exit pathways are usually institutionalised schemes that serve as a bridge for the period between the exit from a career job and the entry into the regular old-age pension system (Kohli and Rein, 1991). They mainly take the form of early retirement pensions, disability benefits or pensions, or (extended) unemployment benefits. In the wake of high unemployment in the late 1970s and early 1980s, such schemes were introduced or resulted from the conversion of other schemes to ease the strain on the labour market and accommodate structural economic changes (Ebbinghaus, 2006). These exit pathways constitute the so-called ‘pull factors’ of labour market exit: by offering easily accessible and relatively generous benefits, they make it attractive for older workers to withdraw from the labour market. Whereas the initial rationale for early exit vanished during economic recovery, early exit persisted as it became a part of workers’ and employers’ expectation patterns and became ‘decoupled from the business cycle’ (Ebbinghaus and Hofäcker, 2013, Hofäcker et al., 2016).

Whereas studies have found that reforming exit pathways can effectively increase employment of older workers (Arpaia et al., 2009, Ebbinghaus and Hofäcker, 2013), such reforms are not without risks or side-effects. In ‘heydays’ of early retirement, Casey (1987) observed that

when closing off one exit pathway there is a risk that older workers will start using other exit schemes that, as a result of such reforms, become relatively more accessible or attractive. This ‘instrument substitution’ might be the intended outcome of policymaking, but it can also occur as the unintended side-effect of policy implementation.

The implications of instrument substitution are even more important in times of reversal of early exit. After all, if the effects of instrument substitution are substantial, the closing off of one exit pathway leads to a net increase in employment rates that is smaller than the decrease in the take-up of that pathway. Moreover, part of the costs of early exit may shift to other sources, creating new inefficiencies elsewhere in the system. In the 1980s, instrument substitution was often at least partly deliberate, motivated by the aim to actually keep early exit possible (Casey, 1987, Ebbinghaus, 2006). Since the 1990s, the primary aim of closing exit pathways has been to increase employment, but little is known if instrument substitution has continued to play a role.

Casey based his findings on case studies with a number of OECD countries. Other studies referring to instrument substitution have been primarily based on single case studies or early retirement from a comparative perspective (Ebbinghaus, 2006, Guillemard, 2016, Guillemard and Van Gunsteren, 1991). In the field of economics, a rather large literature exists on ‘spill-over effects’ of early retirement reforms, which broadly implies a similar mechanism as instrument substitution. These studies usually focus on a single reform in a single country. The aim of this article is to take a quantitative cross-national approach, focusing on the period since 1995 when early exit has been on the decline in Europe. Cross-sectional time-series data from Eurostat are used to analyse whether instrument substitution takes place between pathways and estimate how much spill-over there is.

The article is structured as follows. The next section discusses the existing literature on instrument substitution and spill-over effects. Then, we present our indicators for early exit and the methods for analysing these. In the findings section that follows, we first describe our data and

trends in early exit and employment between 1995 and 2015, followed by analysis of substitution and spill-over effects with the help of regression models. In the final section we discuss our findings in the context of the existing literature and current policy trends, while concluding with some implications for policy-making.

Previous research on instrument substitution and spill-over effects

Casey's study was written at a time when early exit was omnipresent and on the rise in many industrialised countries. Some of the mechanisms he identified continue to be useful in analysing current developments in early exit. First of all, he observed that across countries, there is a great variety of programs that accommodate early retirement by different names, various means and funded from different sources. Some of these programs allow early exit *de facto* by removing the incentives to re-enter the labour market, whereas others promote early exit *de jure* by explicitly offering a generous option to withdraw (Casey, 1987). Yet, they all achieve the same outcome: workers withdraw permanently from the labour market before they reach the statutory retirement age.

This implies that early retirement schemes, disability pensions and extended unemployment benefits that act as exit pathways are to some extent 'functional equivalents'. Functional equivalents can be defined as policy instruments that take different forms but perform similar roles in different national institutional contexts (Bonoli, 2003). In many countries there has been one dominant exit pathway. Hytti (2006), for example, has wondered 'why are Swedes sick but Finns unemployed?', concluding that due to differences in policy strategies even in rather similar welfare states, pressures on the labour market resulted in higher rates of sickness and disability in Sweden, but higher take-up of unemployment benefits and unemployment pensions in Finland. If in one country early exit takes place predominantly through disability benefits but in another country through unemployment benefits, it does not necessarily mean that in one country people's health is worse and in the other

structural unemployment is higher. It is more important to look at the conditions under which benefits can be claimed and what role different benefit schemes play as an exit pathway.

Besides being functional equivalents from a comparative cross-national perspective, exit pathways can act as substitutes within a single country. Casey found in several countries that when the dominance of one pathway declined, the relevance of another increased. This was the case in the 1980s with early-retirement provisions and disability in the Netherlands, unemployment insurance and early old-age pensions in France, and early old-age pensions and special early-retirement schemes in Belgium. Other studies found that a rise in disability rolls due to reduced screening stringency coincided with a decline in low-skilled unemployment in the US in the 1990s (Autor and Duggan, 2003). An extension of the maximum length of unemployment benefits in Austria in the late 1980s resulted in decreases in the take-up of disability benefits (Inderbitzin et al., 2016).

Pathways are usually ‘imperfect substitutes’ at best: there are still specific eligibility rules that will exclude some groups from one scheme but could give them access to another. In a study on Germany, Riphahn (1997) rejected the hypothesis that disability retirement and unemployment are substitutes and that the take-up of both are the result of a different set of individual risks. However, Koning and Van Vuuren (2010) found substantial hidden unemployment in disability insurance enrolments in the Netherlands.

Casey argued that instrument substitution can be the result of deliberate policy-making or an unintended consequence from changes in administrative procedures, often aimed at shifting costs from one program to another. In the period of early exit heydays, instrument substitution was often a deliberate act of policy-making to channel the growing number of early retirees and the increasing costs it accompanied. In times of reversal of early exit, instrument substitution has become more of an undesired and unintended side-effect of closing off exit pathways, but nevertheless there is ample evidence that it is occurring.

In economics literature, the terms ‘spill-over’ or ‘crowding-out’ effects are commonly used: the reform of an early retirement program does not only result in a one-on-one increase in employment, but in a simultaneous increase in take-up of other social benefits or pensions. Spill-over effects can result from raises in eligibility ages (usually in the case of early retirement programs), tightening of eligibility criteria (often regarding disability programs) and shortening of periods of entitlement or changes in the requirements for entitlement (often in the case of unemployment benefits). Reforming a particular exit pathway can result in the increased take-up of another program instead (i.e. substitution of inflow), the extended duration of another type of benefit (i.e. a lack of outflow from the substitute) and increased transitions of beneficiaries directly between the reformed pathway and another program.

Not every reform results in spill-overs. Substantial inflow spill-overs into disability or unemployment were found for reforms increasing early retirement pension ages for women in Belgium (Jousten et al., 2011), the UK (Cribb et al., 2013) and Australia (Atalay and Barrett, 2015), for men in Italy (Ardito, 2017) and for both in Austria (Staubli and Zweimüller, 2013) and the US (Duggan et al., 2007). A study on raising the early retirement age for women in Germany showed that there was an increase in the average duration of unemployment, but that there were no inflow or transition substitution effects: unemployed women stayed unemployed, whereas employed women stayed employed (Geyer and Welteke, 2017).

Disability insurance reforms led to inflow spill-overs into other social assistance programs in the Netherlands (Borghans et al., 2014) and Sweden (Karlström et al., 2008). Kyyrä (2015) and Kyyrä and Pesola (2017) found no substitution effects after reforms in Finnish unemployment pensions and extended unemployment benefits. Lammers et al. (2013) investigated the effects of introducing stricter job search requirements for unemployed older workers in the Netherlands and found that beside increased entry into employment, a higher outflow into disability and sickness benefits also took place. A study on reforms of early retirement and disability in the Netherlands

showed that spill-over effects can be limited if potential substitutes are targeted simultaneously (Euwals et al., 2012).

The remainder of this article investigates whether instrument substitution between early retirement, disability and long-term unemployment can be identified among European countries and to what extent there are spill-over effects. In our operationalisation, in order for substitution to take place, a change in the take-up of one pathway in one direction should be accompanied with a change in the opposite direction in the take-up of other pathways. Spill-overs occur when reductions in early exit do not equal increases in employment rates. Combining the regression of substitution and spill-over effects with analysing long-term trends in exit and employment should enhance our understanding of to what extent these mechanisms are universal across countries and time and contribute to bridging the gap between the economic and the macro-sociological literatures on early exit substitution.

Data and methods

Instrument substitution is analysed based on cross-sectional time-series data for 19 European countries for the period of 1995-2015. The countries include: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, Hungary, Germany, Greece, Italy, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom. Other countries had to be excluded due to too short time series, too large gaps in the data or lack of reliable observations with no possibilities for extra- or interpolation.

Three types of alternative exit pathways are included as dependent variables: early retirement, disability and long-term unemployment. For the operationalisation of early retirement and disability as exit pathway instruments, Eurostat aggregate data was used to calculate the proportion of the population aged 55-64 that was inactive due to retirement and disability (Eurostat, 2018) This was done by using the item 'Inactive population - Main reason for not seeking

employment - %', which includes the options 'Retired' and 'Own illness or disability', for the age group 55-64. These percentages were then multiplied by 'Inactive population as a percentage of the total population', also for the ages 55-64, to obtain the proportions of retirement and disability for the total population in that age bracket.

Admittedly, these are not ideal measures, as they are based on self-reported survey data on reasons for inactivity. It is likely that many who consider themselves retired, may in fact be receiving disability or unemployment benefits. In addition, in different countries the understanding of what constitutes retirement might vary. Moreover, statutory retirement ages differ between countries and sometimes between men and women within countries. Retirement before the age of 65 may therefore in many cases be the norm rather than defined as 'early retirement' by local standards. Nevertheless, retirement at 65 has traditionally been the norm in international comparisons and considered as a desirable minimum age of retiring, while many current pension reforms aim at raising this minimum age (European Commission, 2018). Therefore, it is possible to consider exit before 65 as 'early', even if the pension system in a particular country allows retirement before that age.

Within the same set of responses of 'Inactive population - Main reason for not seeking employment' there was no suitable item that would indicate exit through unemployment. To operationalise an unemployment exit pathway, long-term unemployed (12 months or more) as a percentage of those who are unemployed was multiplied by the unemployment rate of the age group 55-64. Again, this is not an ideal measure of exit through unemployment, but it gives a reasonable indication of the proportion of older workers that are outside the labour market for a longer period due to job loss. In many countries, older workers have great difficulties finding new employment in case of job loss and long-term unemployment often *de facto* means labour market exit.

A final dependent variable is the employment rate of the age group 55-64. Descriptive statistics for each of the variables are available in Table A1 in the Appendix. Table A1 also provides information on the imputations we made in the data. Due to missing values we extra- and interpolated the time-series where this was possible and reasonable. As a rule, we only extrapolated one or two years if there were missing values at the beginning or end of the time series and interpolated when there were few consecutive missing values and when a reasonable trend could be assumed. After imputations, our data included a total of 375 country-year observations. Where possible, we cross-checked imputations of our dependent variables with data for the relevant years from the EU Survey on Income and Living Conditions (EU-SILC) (Eurostat, 2015). EU-SILC allowed calculating aggregate measures of self-reported labour market statuses and actual benefit reciprocity, but only for the years 2004-2014.

Analytical strategy

To identify long-term trends in pathway substitution, we created scatterplots for pairs of pathways. For each country, three-year averages of the share of the population aged 55-64 in a pathway are compared for 1995-1997 (or earliest three years available) and 2013-2015. This results in three plots representing each possible combination of pathways: early retirement – disability, early retirement – long-term unemployment and disability – long-term unemployment. The arrows in the plots indicate the direction of the changes between the mid-1990s and the mid-2010s. Figure 1 shows how these arrows should be interpreted. An arrow pointing towards the origin suggests a contraction in both pathways. When an arrow points away from the origin, the take-up of both pathways expanded. An arrow pointing towards the left-upper corner indicates that Pathway 1 has decreased, but Pathway 2 has expanded, therefore substitution from Pathway 1 to Pathway 2 has

taken place. The other way around, an arrow towards the right-lower corner indicates that Pathway 1 expanded and Pathway 2 contracted, suggesting a substitution effect from 2 to 1.

<Figure 1 about here>

Similar plots were created for the relations between changes in each of the pathways and employment rates between the mid-1990s and the mid-2010s to give an indication of the size of the shifts from early exit in its various forms towards employment. In these three graphs, changes in the pathways are plotted on the x-axis and changes in employment are plotted on the y-axis.

Prais-Winsten regressions with panel-specific autocorrelation structure and panel-corrected standard errors were applied to analyse the time-series-cross-section data (Beck and Katz, 1995, 2011). To identify substitution mechanisms between pathways, we first estimated whether a change in one pathway results in a change in the other two pathways combined. We hereby test the assumption that a change in one exit pathway is accompanied with a change in the other two pathways in the opposite direction. Second, we estimated whether there are certain flows between specific pathways. Next, to identify the size of possible spill-over effects we used the employment rate of the age group 55-64 as the dependent variable and the pathway variables separately and in various combinations as independent variables. We hereby test the assumption that a change in exit pathways does not result in a one-on-one change in employment in the opposite direction, but that there are spill-overs to the other pathways and to other forms of inactivity.

As the dependent variables are likely to be non-stationary we performed the analysis with annual changes rather than their levels (Fortin-Rittberger, 2014). All models include country- and year-fixed effects. Moreover, control variables that offer alternative explanations for changes in exit pathways and employment rates were included. First, a variable for the unemployment rate for the whole working-age population is used to control for business-cycle effects. Second, the size of the population aged 55-64 as a share of the entire working-age population controls for the

possibility that either a larger older workforce creates greater pressure for early exit options or that a larger older workforce provides more incentives to keep older workers in the labour market. To account for differences in health and mortality across countries and across time, we included an indicator for the life expectancy at age 55. Fourth, we controlled for the share of those with lower education (ISCED-2 or less) in the age group of 55-64 to analyse whether early exit is the result of older workers being low-skilled and therefore made redundant more easily. Year-on-year changes in the control variables were lagged with one year in the models. In addition, the level of the dependent variable was included, as we assume the magnitude of existing exit pathways to have an impact on the magnitude of change in a given exit pathway. In other words, changes in each of the pathways are likely to be path-dependent.

Findings

Trends in pathway substitution and transitions into employment

Figures 2-4 show the shifts between pathways between the years 1995-1997 (or earliest three years available) and 2013-2015. Figure 2 indicates that in a majority of countries there was some substitution from early retirement to disability, but that this was far from a one-on-one effect (note the differences in scales for both axes). We can observe a decrease in the share of 55-64-year-old persons in early retirement in almost all countries. While around every third of Europeans in the age bracket 55-64 was in retirement at the beginning of our observation period around mid-1990s, twenty years later the same applied for about every fifth on average. On average, the share of disabled in the age bracket 55-64 has increased from 8.9 to 10.2 percent during our period of observation.

Substitution was largest among countries that had very high levels of early retirement in the mid-1990s, such as Hungary, Slovakia and Slovenia. Only in Norway there was some

substitution the other way around, from disability to early retirement. Poland experienced a drastic decrease in disability, which was only to a very small extent compensated by an expansion of early retirement. Both early retirement and disability expanded in Greece and Sweden, although changes in early retirement were minimal in the latter case. Contraction of both pathways took place in Czech Republic, Finland, Italy, the Netherlands and the UK.

<Figure 2 about here>

The changes between early retirement and long-term unemployment show a somewhat different picture (Figure 3). On average, the share of long-term unemployed in the age bracket 55-64 increased slightly from 3.8 to 4.7 percent. Again, the reduction in early retirement in countries with initially the highest levels was accompanied with an increase in long-term unemployment (Hungary, Slovenia and Slovakia). Milder substitution effects from early retirement to long-term unemployment took place in Czech Republic, Italy and the Netherlands. More substantial substitution from relatively low early retirement to high long-term unemployment were found in Portugal and Spain. A drastic increase in long-term unemployment also took place in Greece, accompanied with an expansion of early retirement at the same time. The increases in long-term unemployment in these three countries can obviously be seen as the effects of the economic recession. Small substitution effects from long-term unemployment to early retirement are found in Norway and Poland. In the other countries, these two pathways both contracted at the same time or one decreased while the other remained relative stable. On average, as indicated by the red arrow, there seems to be a shift from early retirement to long-term unemployment, but this effect was mainly due to the outlying positions of Slovakia, Slovenia and Hungary, as well as Spain, Portugal and Greece.

<Figure 3 about here>

In Figure 4, we can see relatively little substitution between disability and long-term unemployment. There was some substitution from disability to long-term unemployment in Czech Republic, Italy and the Netherlands. There was substitution from long-term unemployment to disability in Denmark, Germany (mainly a reduction in long term-unemployment) and Sweden (mainly an increase in disability). In Finland, Norway, Poland and the UK, both pathways contracted to a smaller or larger extent. Expansion of both pathways took place in the other countries. In Greece, Spain and Portugal the largest increases took place in long-term unemployment, while in Slovakia and Hungary disability accounted for the largest expansion. The short red arrow suggests that although some of the contractions and expansions are quite large, they tended to even each other out in the European average.

<Figure 4 about here>

Figures 5-7 show the relations between changes in each of the exit pathways and the employment rates for the age group 55-64, again between 1995 and 2015. There is a clear relation between decreases in early retirement and increases in employment rates (Figure 5). Almost all arrows point towards the top-left corner. Exceptions are Norway (increases in both early retirement and employment), Poland (idem), Portugal (decreases in both early retirement and employment) and Greece (increase in early retirement and decrease in employment). The relation between disability and employment rates is not as straightforward (Figure 6). There is a group of countries where a contraction of disability was accompanied with an increase in employment and another group of countries where employment rates grew in spite of increasing disability. There appears to be some indication for a convergence effect: disability increased in countries with lower disability rates, but decreased in countries with higher disability rates.

<Figures 5-7 about here>

In the case of long-term unemployment (Figure 7), again Greece, Portugal and Spain stand out, with large increases in unemployment rates and decreases or a modest increase in employment. Otherwise there appear to be two broad groups of countries. In one group employment rates were low in the mid-1990s and increases in employment were accompanied with increases in long-term unemployment (e.g. Czech Republic, Hungary, Italy, Slovenia, the Netherlands). In another group, employment rates were already higher in the mid-1990s and increased further in the 2000s, while long-term unemployment decreased (e.g. Norway, Sweden, United Kingdom, Denmark and Estonia).

Regression analysis of substitution and spill-over effects

Table 1 presents the results of the time-series-cross-section regression analysis. Models 1-3 show the results for the association between the changes in one pathway with changes in the other two pathways combined. Models 4-6 show the results for the substitution effects of the separate pathways. Model 1 indicates that a 1 percent point change in early retirement was associated with a 0.37 percent point change in the opposite direction of disability and long-term unemployment. Model 2 indicates that a 1 percent point change in disability was associated with a 0.64 percent point change in the opposite direction of early retirement and long-term unemployment. In Model 3 we do not find any statistically significant association between changes in long-term unemployment on one hand and early retirement and disability on the other.

Models 4 and 5 further confirm that the strongest substitution took place between early retirement and disability. Changes in long-term unemployment were not statistically significantly related to changes in early retirement. Models 4 and 6, however, show that there were negative associations between disability and long-term unemployment, although the effect of long-term unemployment on disability was only significant at $p < 0.05$ and the effect of disability on

long-term unemployment was small ($b = 0.05$). Apart from a relation between the overall unemployment rate and the pathways, and especially the long-term unemployment rate among the 55-64 years old, there were no statistically significant effects of the controls apart from a negative association of life-expectancy with long-term unemployment (Model 6). These results indicate that cyclical effects still played a role in determining early exit among older workers and that a healthier older workforce was less at risk of becoming long-term unemployed.

<Table 1 about here>

Table 2 shows the relations between changes in the pathways, separately (Models 7-9) and in various combinations (Models 10-11), and changes in the employment rates of the 55-64 years old. Models 7 and 9 indicate relatively strong associations between changes in the employment rate and changes in early retirement and unemployment, respectively. Yet, especially the relatively low coefficient of early retirement ($b = -0.16$, Model 7) indicates that there was substantial spill-over to other kinds of non-employment. In Model 8 we did not find a statistically significant relation between disability and employment. The effect sizes became larger when combining changes in early retirement and disability ($b = -0.23$, Model 10) and when adding long-term unemployment ($b = -0.25$, Model 11). In other words, the findings suggest that when the total of the pathways declined together, spill-over effects were more limited and the association with employment growth was largest. Apart from relations between the overall unemployment and lagged dependent variable indicators with dependent variable, we found no statistically significant effects for any of the control variables.

<Table 2 about here>

Discussion

Since the mid-1990s, European policies have undergone an almost paradigmatic shift from promoting early exit of older workers towards ‘extended working lives’ and ‘active ageing’

(Ebbinghaus and Hofäcker, 2013). One of the dominant mechanisms in increasing labour market participation among older workers has been to close off the opportunities for leaving the labour market prematurely and before reaching the statutory pension age. Altogether, the average share of older workforce being inactive due to early retirement, disability and unemployment decreased from nearly half (47.6%) to a bit more than one-third (37.6%) in the 19 European countries of our sample from the mid-1990s to the mid-2010s. In other words, today early exit from labour market is less common and the role of early exit pathways as ‘pull factors’ is less distinctive than twenty years before.

Different benefit and pension schemes can serve as substitutes or functional equivalents in facilitating early exit (Casey, 1987, Kohli and Rein, 1991). Reforms that limit access to these and that promote and sanction reintegration to the labour market have decreased the incidence of early exit. We investigated the possibility that limiting access to one exit pathway does not always straightforwardly increases employment but leads to an increase in another pathway. Since the publication of Casey’s (1987) seminal work, ample evidence has been provided for instrument substitution in early exit. Qualitative macro-sociological case studies as well as quantitative micro-econometric studies have shown that substitution is a relatively common phenomenon. Yet, these studies usually look at relatively short time spans, often following a single reform, and at single countries only. Little research has been done on the universality of these substitution effects across countries and their direction and perseverance over a longer period of time and during the current age of ‘extended working lives’.

Visual analysis of shifts between the exit pathways between the mid-1990s and mid-2010s confirmed the relevance of the substitution effects between pathways. In almost all European countries, the incidence of retirement before the age of 65 has declined. In many countries the decline of early retirement was accompanied with increases in disability and in some countries with

increases in long-term unemployment. Exceptions were Finland and the UK, where all pathways contracted and where no substitution was found to take place in the long run.

The largest reductions in early retirement took place in some of the post-communist countries, such as Hungary, Slovenia and Slovakia. In these countries, regular retirement age was comparatively low in the early 1990s and raising the retirement age has been one of the main objectives of pension reforms. Accordingly, the decline in early retirement in these countries was not only due to the closing of early retirement pathways, but to the rising regular retirement age that in many countries has been below 65, in particular for women (OECD, 2013). It is possible that disability programs had been relatively underdeveloped, but increased in their significance once access to early retirement became limited. Moreover, some of these countries were hit relatively hard by the economic recession of the late 2000s, explaining increases in long-term unemployment.

Southern European countries that suffered the most from economic recession and unemployment during and after the financial crisis of 2008, also show the greatest increase of long-term unemployed in the 55-64 age group. In Greece, even all early exit pathways expanded between 1995 and 2015. Portugal and Spain managed to reduce earlier retirement, but experienced expansion of disability and long-term unemployment. In contrast, long-term unemployment among elderly workforce has diminished the most in Finland and Germany, both of which suffered from high long-term unemployment rates among the older workforce in the mid-1990s. Yet, in Germany, as well as in Denmark and Sweden, reductions in long-term unemployment were accompanied by higher disability rates.

There seemed to be a relatively straightforward long-term relation between decreases in early retirement and increases in employment among most countries. The relations between disability and long-term unemployment, on the one hand, and employment rates on the other were less clear. There was a group of countries where increases in employment were accompanied with

decreases in disability, but also a group where employment rose in spite of increases in disability. Decreases were most common in countries that suffered from initially high levels of disability and it is likely that these decreases were instrumental in increasing employment rates. Arguably, in countries that initially enjoyed lower levels of disability, it became a relatively more frequently-used exit pathway as other opportunities for early exit were reduced in the 2000s and 2010s. In those countries, older workers with minor health problems perhaps were previously able to use early retirement schemes, whereas nowadays they need to qualify as disabled to be able to exit early.

Regarding the relation between long-term unemployment and employment rates, three broad categories of countries could be identified. The first consists of the Mediterranean countries Spain, Portugal and Greece that suffered most from the economic recession in the late 2000s and where growth in employment rates stagnated while unemployment rates increased substantially. In the other two groups, employment rates grew but in the one long-term unemployment rates increased while in the other they decreased. Increases in long-term unemployment were found especially among countries where employment rates in the mid-1990s were particularly low. It seems that in these countries older workers were more vulnerable when the economic crisis hit than in countries where older workers had been previously better integrated and where their employment rates have traditionally been higher.

With the use of cross-sectional time-series data for 19 European countries, our regression analysis showed that substitution effects were common and substantial. The small or non-significant effects of the control variables excluded other explanations for changes in the exit pathways, such as developments in populations' age structure, health situation and education levels. Substitution took place between early retirement and disability in particular. This finding is supported by single-countries studies on the spill-over effects between early retirement and disability (Ardito, 2017, Atalay and Barrett, 2015, Duggan et al., 2007, Jousten et al., 2011). It

seems likely that reforms to increase retirement ages and close off early retirement in Europe have led to greater inflows into or fewer outflows from disability benefits. Yet, the size of the substitution effects also indicated that early retirement and disability were not entirely functional equivalents but imperfect substitutes only.

There were small but statistically significant substitution effects between changes in disability and long-term unemployment. Various studies have shown that disability benefits often contain a certain degree of ‘hidden unemployment’: people lose their jobs, but qualify for disability benefits and thereby exit the labour market (Autor and Duggan, 2003, Koning and Van Vuuren, 2010). However, it is possible that long-term unemployment is an inadequate indicator of unemployment as an early exit pathway, due the primarily cyclical nature of long-term unemployment. The findings showed that long-term unemployment among older workers was strongly affected by the state of the economy, although early retirement and disability as early exit pathways were also not entirely ‘decoupled from the economic cycle’ (Ebbinghaus and Hofäcker, 2013): there were positive relations between the overall unemployment rate and each of the combinations of exit pathways.

The results of the regression models also confirmed the descriptive evidence from Figure 5 that there was a strong negative relation between changes in early retirement and employment rates. Unsurprisingly, there was also a negative relation between long-term unemployment and employment, as both are closely interrelated. However, there was no statistically significant relation between disability and employment rates. This supports our other findings that disability acts as a substitute for the other two pathways, but that in times of employment growth its development was path dependent and related to the initial institutional arrangements in early retirement and disability programs. The results also showed that effects on the employment rate were largest when combining changes all three pathways. This supports earlier

research that has found that spill-overs effects are minimised and employment effects optimised when pathways are reduced simultaneously (Euwals et al., 2012).

One limitation to this study was that it is difficult to identify the exact flows between pathways based on this data and impossible to discuss causal effects. However, whereas single-country econometric studies have stronger claims about causal relations related to single reforms, they lack the ability to explain more universal trends and shifts over longer periods of time. Therefore, our approach of looking at trends in a cross-country comparative setting may increase a deeper understanding of substitution and spill-over effects.

One further limitation of this study is the availability and operationalisation of data that actually measure the size of each of the pathways and that allow accurate comparisons between countries. Problematic with the self-reported data is that retirement and disability might mean different things in various countries or even between individuals within a single country. Unemployment might be more hidden in some countries, due to those losing their jobs being granted an early retirement pension or disability benefits (Koning and Van Vuuren, 2010).

Moreover, the data did not allow investigating whether substitution effects were the result of intended policy-making or an unforeseen side-effect of policy reforms. An important role in further research on this topic should be ascribed to cost-shifting mechanisms between different early exit programs, both publicly and privately funded (Casey, 1987). Although central to Casey's study, cost shifting could not be investigated further due to a lack of adequate aggregate data concerning spending on early exit programs.

Nevertheless, the findings are in line with other, both qualitative and quantitative, studies and suggest that instrument substitution takes place in its various forms between countries and over time. This has at least two important implications for policy-making. The first concerns efficiency. In the current age of extending working lives, it needs to be taken into account that,

when closing off a dominant exit pathway, workers in the later stages of their careers might seek other ways to withdraw from the labour market. Therefore, our study confirms that policy-makers are advised to take a comprehensive approach to early exit and address all possible spill-overs towards inactivity, if increased labour market participation of older workers is the aim of the reform (Euwals et al., 2012).

This comprehensiveness, however, should not only include addressing exit pathways simultaneously in order to remove the factors that ‘pull’ older workers from the labour market, but also aim at measures that enable older workers to continue working and reduce the effects of the so-called ‘push factors’ of labour market exit (Ebbinghaus and Hofäcker, 2013). Such measures may include appropriate training and health policies, as well as removing other barriers that keep older workers from being retained or hired. This becomes even more relevant when in many countries retirement ages are raised further. A recent Dutch study predicted that future increases in the retirement age will not result in spill-overs into disability benefits, but only under assumption that the health of older workers continues to improve (Dillingh et al., 2018).

The second implication concerns issues of equality and equity among older workers. Whereas most studies find that employment effects of early exit reforms dominate substitution effects, there are socioeconomic inequalities between those who remain employed and those who make use of the substitutes (Ardito, 2017, Geyer and Welteke, 2017). Early exit and inactivity at older age increasingly become the exclusive domain of lower socioeconomic classes and those in poor health with few possibilities for extended working lives. Moreover, considering the motive of many reforms to reduce or shift costs, the substitutes are likely to be financially less generous or not a permanent option out from the labour market, but, in case of for example unemployment or sickness benefits with a maximum duration, rather a temporary stop on the way to a next job. This could result in greater poverty, insecurity and precariousness in the late careers of disadvantaged groups in particular. Therefore, in times when extended working lives are increasingly becoming

the norm, social policies should address these inequalities comprehensively and consistently over the life course.

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Figures

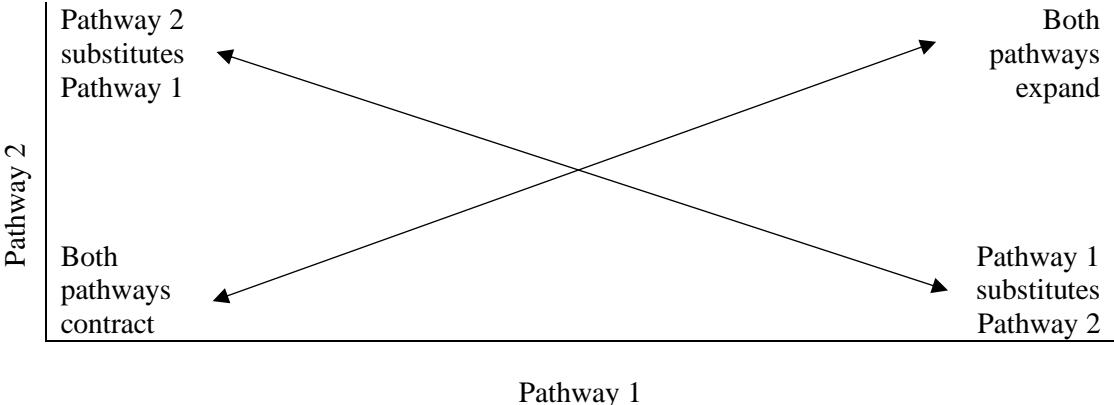


Figure 1. Identifying substitution effects between two early exit pathways

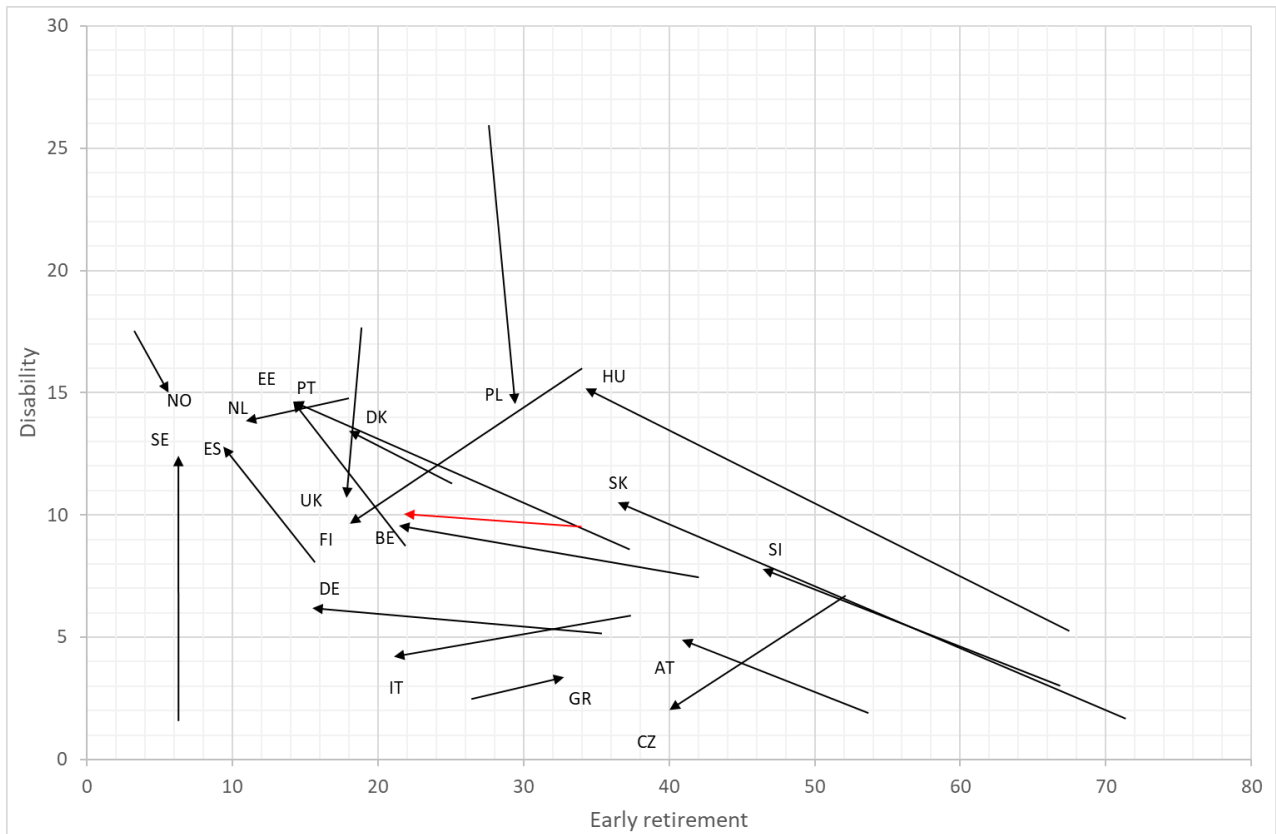


Figure 2. Changes in % inactivity due to retirement and illness and disability among aged 55-64 between 1995 and 2015 (averages for all countries in red)

Source: Eurostat.

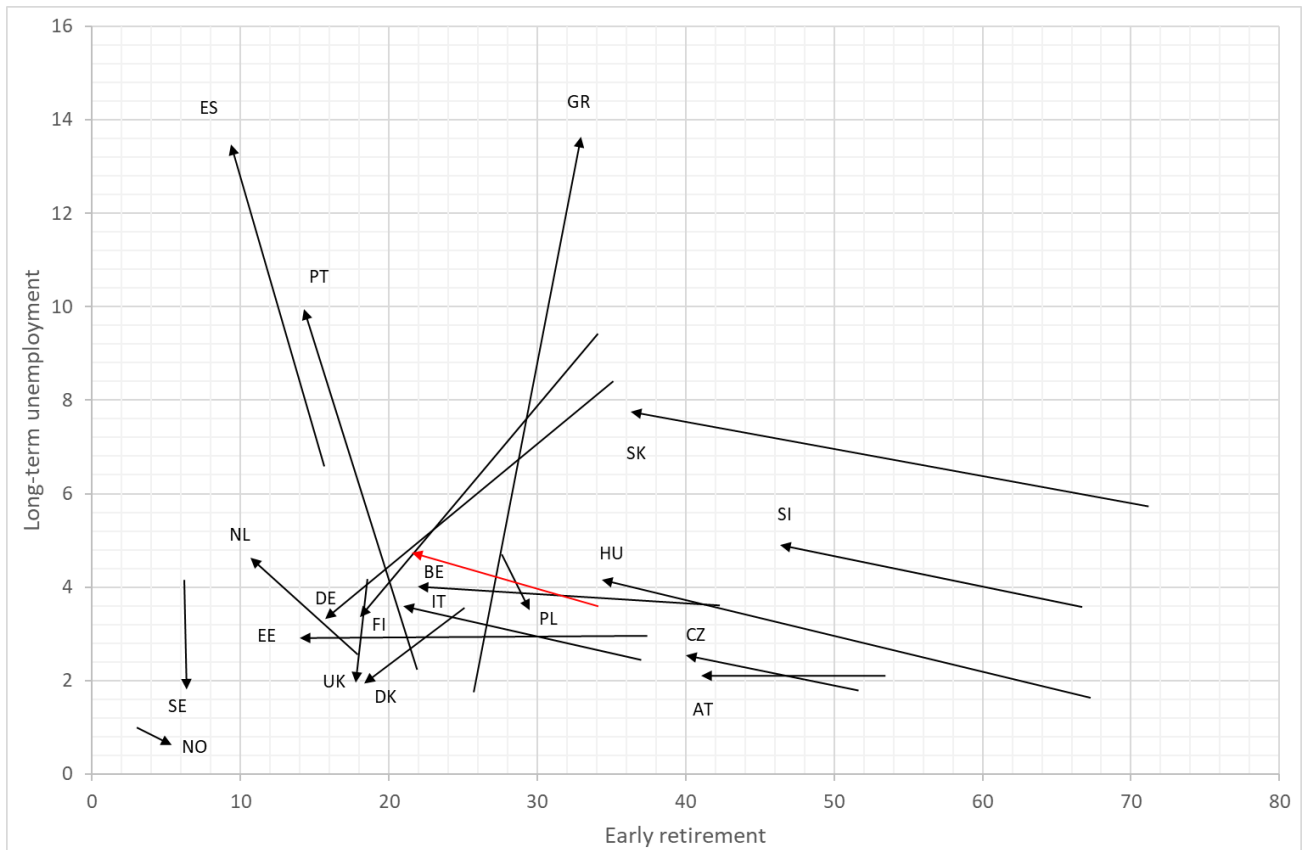


Figure 3. Changes in % inactivity due to retirement and long-term unemployment among aged 55-64 between 1995 and 2015 (averages for all countries in red)

Source: Eurostat.

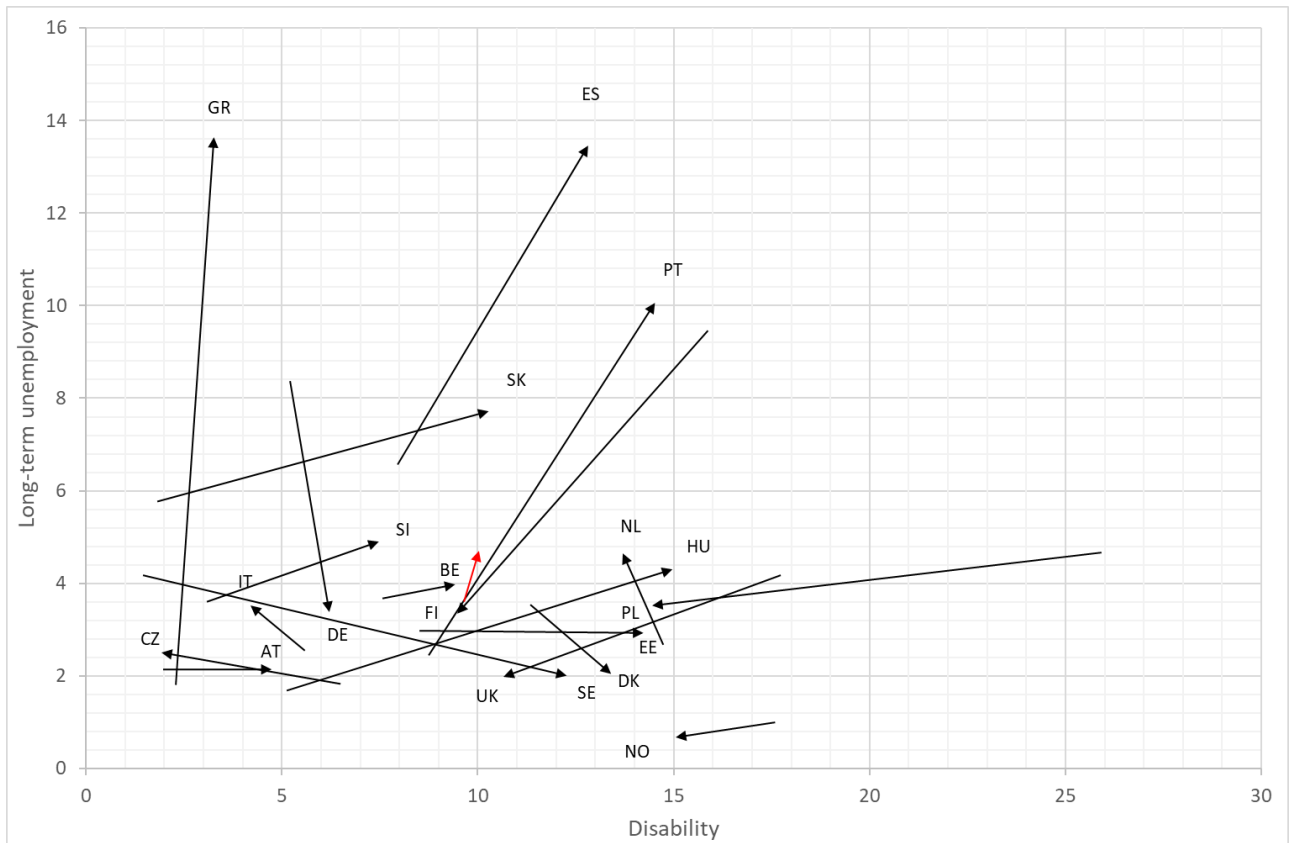


Figure 4. Changes in % inactivity due to illness and disability and long-term unemployment among aged 55-64 between 1995 and 2015 (averages for all countries in red)

Source: Eurostat.

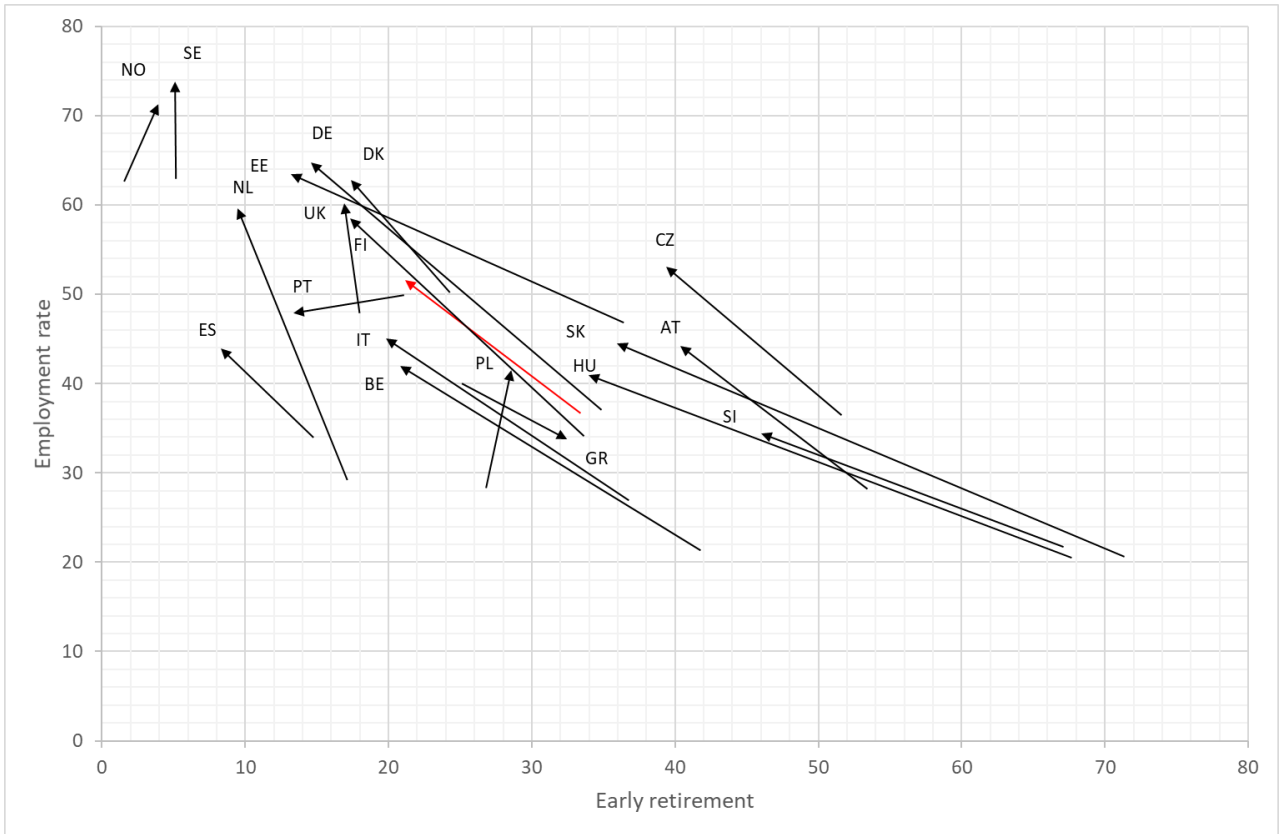


Figure 5. Changes in % inactivity due to retirement and the employment rate among aged 55-64 between 1995 and 2015 (averages for all countries in red)

Source: Eurostat.

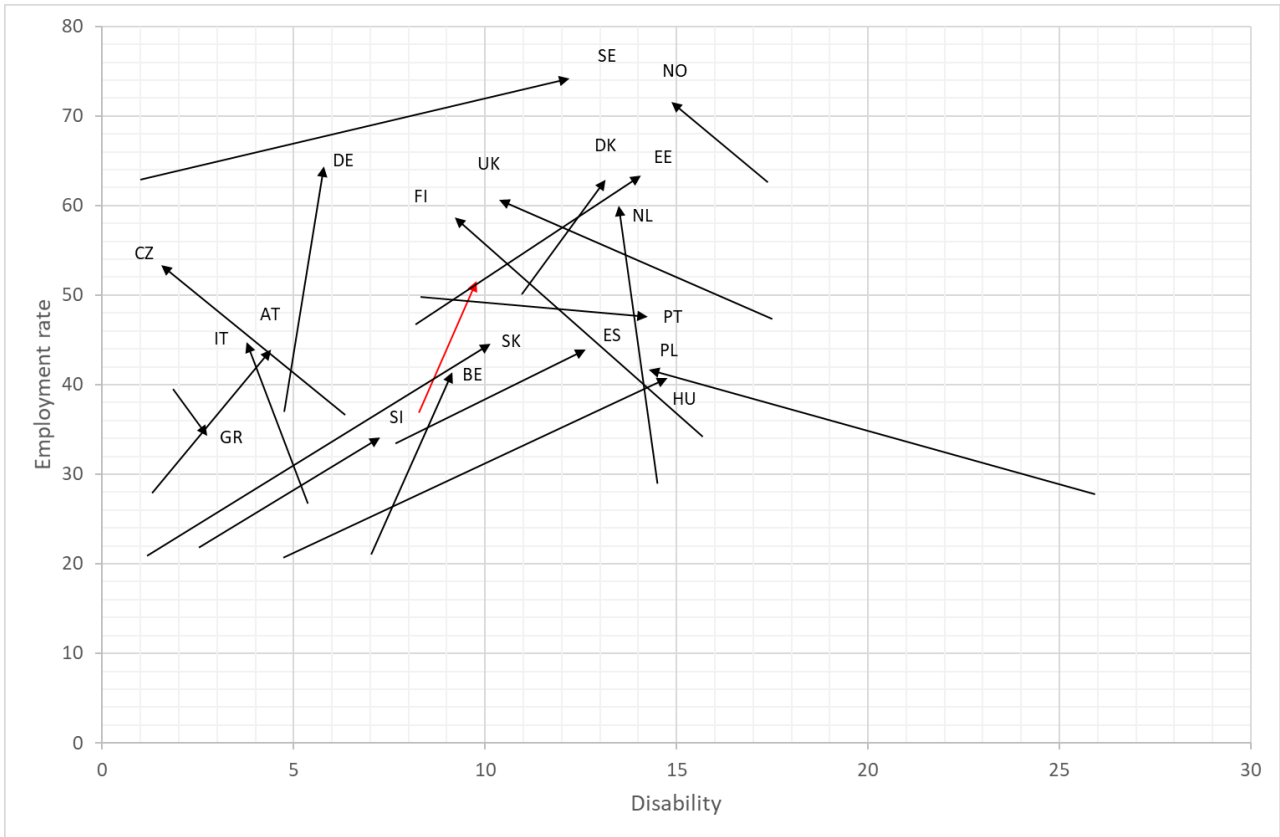


Figure 6. Changes in % inactivity due to illness and disability and the employment rate among aged 55-64 between 1995 and 2015 (averages for all countries in red)

Source: Eurostat.

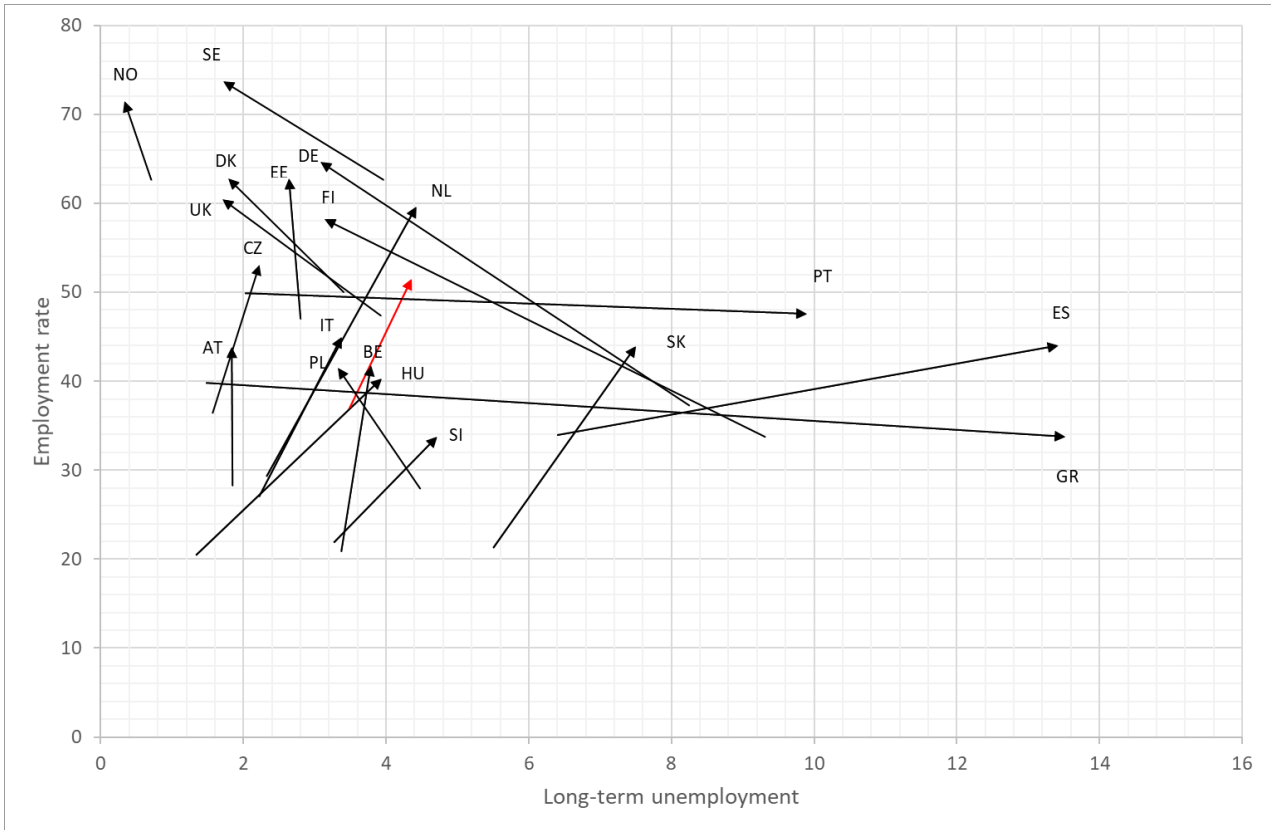


Figure 7. Changes in % inactivity due to long-term unemployment and the employment rate among aged 55-64 between 1995 and 2015 (averages for all countries in red)

Source: Eurostat.

Tables

Table 1. Associations in changes between early exit pathways in Europe, 1995-2015

	1 Disability + long-term unemployment	2 Early retirement + long-term unemployment	3 Early retirement + Disability	4 Disability	5 Early retirement	6 Long-term unemployment
Pathways						
Early retirement	-0.365*** (0.028)			-0.358*** (0.0264)		-0.0147 (0.012)
Disability		-0.638*** (0.0618)			-0.581*** (0.060)	-0.052** (0.019)
Long-term unemployment			-0.170 (0.163)	-0.295* (0.120)	-0.102 (0.155)	
Controls						
Overall unemployment rate t_{-1}	0.499*** (0.061)	0.570*** (0.074)	0.255* (0.109)	0.189* (0.085)	0.207* (0.0947)	0.427*** (0.032)
Population aged 55- 64 t_{-1}	0.246 (0.230)	-0.013 (0.405)	-0.192 (0.378)	0.149 (0.216)	-0.327 (0.402)	0.113 (0.082)
Life expectancy at age 55 t_{-1}	-0.645 (0.442)	0.586 (0.607)	0.759 (0.653)	-0.343 (0.401)	0.940 (0.595)	-0.424* (0.214)
Share low-educated in age group 55-64 t_{-1}	-0.019 (0.049)	-0.023 (0.064)	-0.007 (0.073)	-0.001 (0.048)	-0.013 (0.063)	-0.012 (0.016)
Dependent variable (level) t_{-1}	-0.105** (0.032)	-0.092** (0.028)	-0.124** (0.0429)	-0.151** (0.046)	-0.139*** (0.0341)	-0.046* (0.021)
Constant	0.927** (0.319)	4.530** (1.694)	6.312* (2.527)	0.511* (0.254)	6.688*** (1.942)	0.288 (0.185)
R ²	0.483	0.496	0.218	0.443	0.466	0.622
RMSE	1.494	1.998	2.006	1.413	1.911	0.619
N	337	337	337	337	337	337

Note: Prais-Winsten regression estimates with panel-specific autocorrelation structure and panel-corrected standard errors (in parentheses). Unit and period fixed effects included, but not displayed. * p<0.05, ** p<0.01, *** p<0.001.

Source: Eurostat.

Table 2. Associations between changes in early exit pathways and employment rates in Europe, 1995-2015

	7	8	9	10	11
	Employment rate	Employment rate	Employment rate	Employment rate	Employment rate
Pathways					
Early retirement	-0.159*** (0.027)				
Disability		-0.042 (0.034)			
Long-term unemployment			-0.337*** (0.094)		
Early retirement + Disability				-0.226*** (0.033)	
Early retirement + Disability + Long-term unemployment					-0.247*** (0.032)
Controls					
Overall unemployment rate t_{-1}	-0.382*** (0.054)	-0.402*** (0.056)	-0.265*** (0.065)	-0.365*** (0.053)	-0.264*** (0.053)
Population aged 55-64 t_{-1}	-0.220 (0.159)	-0.344 (0.190)	-0.325 (0.191)	-0.230 (0.147)	-0.206 (0.142)
Life expectancy at age 55 t_{-1}	-0.065 (0.393)	-0.263 (0.390)	-0.365 (0.381)	-0.213 (0.378)	-0.312 (0.367)
Share low-educated in age group 55-64 t_{-1}	-0.013 (0.034)	-0.009 (0.037)	-0.0109 (0.037)	-0.003 (0.034)	-0.005 (0.033)
Dependent variable (level) t_{-1}	-0.045* (0.020)	-0.061** (0.021)	-0.065** (0.020)	-0.045* (0.020)	-0.047* (0.019)
Constant	1.354* (0.622)	2.102** (0.687)	2.182*** (0.645)	1.462* (0.613)	1.528** (0.573)
R ²	0.496	0.445	0.464	0.513	0.538
RMSE	1.026	1.083	1.061	0.991	0.961
N	337	337	337	337	337

Note: Prais-Winsten regression estimates with panel-specific autocorrelation structure and panel-corrected standard errors (in parentheses). Unit and period fixed effects included, but not displayed. * p<0.05, ** p<0.01, *** p<0.001.

Source: Eurostat.

Appendix

Table A1. Descriptive statistics of the main variables

Variable	Mean	SD	Min	Max	No. of imputed country-years	Imputations per country
<i>Main dependent and independent variables (% of population 55-64)</i>						
Retired	29.17	16.7	1.62	72.83	5	BE(2), DE(1), UK(2)
Disabled	9.75	5.43	0.96	28.21	12	BE(6), DE(1), SI(1), ES(1), UK(3)
Long-term unemployed	3.63	2.62	0.36	14.84	16	AT(1), BE(1), EE(3), NL(2), NO(5), SI(2), SE(2)
Employed	45.15	13.43	19.40	74.50	4	CZ(1), FI(1), NO(1), SE(1)
<i>Controls</i>						
Unemployment rate	8.64	4.43	2.10	27.50	0	
Share 55-64 of total working-age population	17.57	2.12	12.68	22.36	0	
Life expectancy at 55	26.29	1.88	21.40	30.10	0	
Share of population aged 55-64 with lower education only	40.76	20.83	9.80	92.80	9	AT(4), CZ(1), DE(1), NL(1), NO(1), UK(1)

Source: Eurostat.