Positive Welfare State Dynamics?
Sickness Benefits and Sickness Absence in Europe 1997-2011

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Abstract

Sickness absence is associated with great costs for individuals, companies and society at large. Influenced by neo-classical economic theory, policy advice has emphasised the role of sickness benefit programs for reducing sickness absence rates: too generous benefits without proper control will increase the number of recipients and prolong absence spells as well as possibly cause negative dynamic effects in the long term. This study provides an alternative interpretation of the relationship between sickness benefits and sickness absence. By combining an epidemiological approach to sickness absence and a resource-based approach to welfare, we argue that sickness benefits might be viewed as a “collective resource” that, by providing economic support during times of ill-health, might have positive health effects. Statistical analysis of short-term sickness absence using innovative methodological approaches and combined micro- and macro-level data for 20 EU countries over the period of 1992-2011 indicates that while generous sickness benefits might lead to higher sickness absence in the short run for some socioeconomic groups, the long run effects of relatively generous sickness benefits is rather to reduce sickness absence, especially among more vulnerable groups. This result also has implications for sickness benefit reform: whereas benefit cuts may reduce absence in the short run, in the longer run such reforms may actually increase sickness absence rates.
Introduction

Sickness absence is associated with considerable costs for individuals, companies and society at large (OECD, 2010). Multiple factors, ranging from proximate and concrete factors such as the health status of individuals, their working environment and economic incentives created by welfare systems, to more abstract changes in norms and attitudes has been put forward in order to understand variations and trends in sickness absence over time and between social groups and countries. For the present purpose, this literature can be divided into two main strands (Mazzuco & Suhrcke, 2010; Pouliakas & Theodossiou, 2013). One strand of literature, largely originating from neo-classical economic theory, considers sickness absence as a manifestation of workers’ labour supply decisions. Another strand, henceforth called the epidemiological perspective, views sickness absence as predominantly caused by ill-health and infirmity.

The purpose of this paper is to discuss these two approaches – the neo-classical and the epidemiological – with regards to the relationship between sickness benefits and sickness absence. Additionally, this study tests a set of hypothesis derived from these approaches using individual-level data for 20 countries from the European Labour Force Survey for the period of 1992-2010. The focus on sickness benefits means that we do not take into account a range of other theoretical explanations that have been proposed for explaining sickness absence (see e.g., Beemsterboer et al., 2009). Whereas rather specific hypotheses can be derived from the neo-classical perspective, the epidemiological perspective in itself has little to say about the nature of this relationship. However, by combining the epidemiological perspective with a resource-based view of welfare, a set of hypotheses can be formulated that in important ways contradicts the hypotheses derived from the neo-classical perspective. Hypotheses derived
from the neo-classical perspective have been tested repeatedly; however, few alternative and theoretically-informed hypotheses on the relationship between sickness absence and sickness benefits have been formulated and subjected to empirical tests.

This paper addresses a fundamental dilemma in research about sickness benefits and sickness absence, a dilemma that seldom is acknowledged by researchers and policy-makers. Work (with reasonably good working conditions) is generally beneficial to people’s health as well as for the financial viability of the welfare state. Therefore, an often heard policy advice is that institutional reform should focus on reducing the economic incentives for workers to report sick, by for example, reducing benefits. However, if sickness absence is primarily a manifestation of the health status of individuals, reducing economic compensation during sickness may be detrimental to people’s health. Being sick is often associated with additional expenses, and financial strain during sickness may lead to isolation, inactivity and other personal and social problems that may prolong the period of sickness absence. It is conceivable that due to a deterioration of health conditions, reducing benefits or tightening qualifying conditions will have very little effects on, or even increase, aggregate sickness absence rates in the longer run.

**Sickness Absence and the Welfare State**

The theoretical approach that most explicitly deals with the relationship between sickness absence and sickness benefits is neo-classical economic theory (see e.g., Barmby et al., 1991). This approach views sickness absence as the outcome of a rational decision-making process about how much labour to supply on the market, and as such, is largely determined by subjective evaluations of the cost and benefits associated with alternative courses of action. Although it is often (but not always) acknowledged that individuals’ health status is an important determinant behind sickness absence, an underlying assumption is that
given their health status, more generous sickness benefits will increase the likelihood that workers will report sick. By making it less costly to be absent from work, more generous sickness benefits may induce individuals to report sick when their ailment does not represent a medical hindrance for attending work or to be absent from work longer than required for strictly medical reasons. Generous economic compensation may also induce people to expose themselves to conditions and situations that increase the likelihood of ill-health or accidents and subsequent absence. Such effects, when people’s behaviour is affected when they are insured against losses, are often termed moral hazard, and at the extreme it may entail outright fraud by claiming benefits on false grounds. A majority of studies using country-level data appear to find that employees adapt their short-term sick leave behaviour to economic incentives as standard neo-classical economic theory would predict (for an overview, see Osterkamp & Röhn, 2007), although there are also studies finding no such effect (see e.g., Leigh, 1991). Comparative studies also suggest that the level of sick pay and generosity in terms of granting sick leave may explain part of the cross-country differences in sickness absenteeism (see e.g., Lusinyan & Bonato, 2007; Osterkamp & Röhn, 2007).

In the neo-classical economic approach to sickness absence, both moral hazard and benefit fraud have also been linked to negative dynamic effects in the long term. The basic argument is that individuals might respond to the incentives provided by sickness benefit programs with a time lag as they are constrained by social norms and habits (Halla et al., 2010; Lindbeck, 1995). To stay on benefits longer than needed for strictly medical reasons or to falsely claim sickness benefits is to violate strong social norms about self-reliance that were established long before the formation of modern welfare states. Violation of such norms may cause both individual discomfort or disutility and a loss of reputation in society, possibly accompanied by some form of punishment (e.g., exclusion from valued social groups). However, as welfare and taxation systems have reduced the economic return from work and
made individual savings in order to cope with the misfortunes of life more or less redundant, habits and norms slowly and gradually come to adjust to the new incentive system. Moreover, as it is argued that the supply of benefits will create its own demand (i.e., Say’s law) and as the number of people using sickness benefits will increase, the power of social norms emphasizing self-reliance will decrease. Therefore, as time evolves, the disincentive effects of the welfare state will slowly materialize, giving rise to “hazardous welfare-state dynamics” and a self-destructive welfare state.

In stark contrast to neo-classical economic theory, epidemiological research has tended to view sickness absence as primarily a manifestation of the health status of individuals rather than as a result of rational decision making. Research within this perspective has largely focused on analysing how different risk factors (e.g., at the individual, organizational or population level) influence sickness absence. Although it is often pointed out that sickness absence cannot be used uncritically as a health measure because other factors such as working conditions and family circumstances are also of importance, studies within this approach have shown that there is a strong association between morbidity and sickness absence. For example, Marmot et al. (1995) report that baseline measures of health such as self-rated health, angina symptoms, diabetes history, psychiatric symptoms and reported health problems in the last year were strong predictors of both long and short spells of sickness absence, and that sickness absence, therefore, can be used as “an integrated measure of physical, psychological, and social functioning in studies of working populations” (p. 124). Similarly, Vahtera et al. (2004) and Kivimäki et al. (2003) show that sickness absence, both long-term absence and short-term spells, are strong predictors of all-cause mortality and mortality due to cardiovascular disease, cancer, alcohol-related causes and suicide, and that “sickness absence data could be used as a global measure of health differentials between employees” (Kivimäki et al., 2003, p. 364).
Yet, the epidemiological approach has rather little to say about the relationship between sickness benefits and sickness absence. This is not surprising, as this approach views sickness absence as resulting from individual ill-health and leaves little room for incentive effects created by sickness benefits or other societal institutions. However, we propose that by combining the epidemiological approach with so-called resource-based theories of health and health inequalities, we can arrive at an alternative interpretation of this relationship.

We use resource-based theories of health and health inequalities as an umbrella term for approaches that emphasizes access to different resources as important determinants for people’s health and wellbeing, and that inequalities in different types of resources also tends to generate inequalities in health. Because health is also an important resource in itself, health inequalities are also likely to sustain and further propel inequalities in other areas. An early example of this line of thought is found in Scandinavian welfare research, where people’s command over resources such as income, education, social relations etc., were seen as essential for their ability to control and consciously steer the direction of their lives (Johansson, 1973). Similar thoughts are found in the so-called Fundamental Cause Perspective (Freese & Lutfey, 2011; Phelan et al., 2010), where strong emphasis is put on resources, such as knowledge, money, power, and beneficial social connections, and how they are used in order for people to avoid risks and adopt protective strategies that are beneficial for their health. Similarly, the so-called Social Determinants Perspective focuses on the very same conditions and resources as key factors for good health: “…health inequities arise from the conditions in which people are born, grow, live, work, and age and inequities in power, money, and resources that give rise to these conditions of daily life” (Marmot et al. 2012, p. 1013).

Some of these resources, such as income generated on the market and educational resources are generated on and operated mainly at the individual or household level. But
individuals can also draw upon collective resources supplied by their communities. Such collective resources include social insurances and income transfers and welfare services, such as school and health care systems, subsidised or free of charge (Lundberg et al. 2014). As many are faced with various situations across the life course where their individual or household resources may be insufficient, the provisions of and access to collective resources are likely to make an important contribution to health and wellbeing, not the least amongst are the more disadvantaged groups in society (Marmot et al., 2012). It has also been argued that it is rather the accumulation of conditions and access to resources over the lifecycle that determines present health (see e.g., Vågerö & Illsley, 1995), which also implies that access to collective resources over the life course should matter for present health.

Now, accepting the dual premises that (a) sickness absence is primarily a manifestation of the health status of individuals, and (b) that access to various resources have both direct and long-run effects on health and socio-economic differences in health, then it follows that access to collective resources providing economic support during times of ill-health may also be of importance for individual health trajectories. If collective resources such as sickness benefits are not available to a sufficient extent during sickness absence spells, and people therefore are troubled by financial worries or do not have the financial resources necessary to obtain necessary treatment or medicine, this might be an obstacle to a successful recuperation from whatever ailment they might suffer from. Illness in itself is often an obstacle to participating in social life and activities and upholding valuable social contacts, and the reduction on economic resources brought about by sickness absence may further exacerbate such effects. Thus, there may be protective effects of income during sickness which may be beneficial for recovery from illness and decrease the likelihood of transitions into long-term sickness absence or permanent absence from the labour market (Gjesdal et al., 2004).
However, a review of the literature reveals that we know relatively little about how economic conditions during sickness absence affects health and wellbeing, and how this in turn affects the duration of absence and the likelihood of returning to work and transitions into permanent absence from the labour market (Vingård et al., 2004). On a more general level (i.e., not restricting the discussion to individuals who are sickness absent), it has been shown that people who frequently have to forgo consumption of goods and services for financial reasons are also more likely to suffer from an accumulation of other welfare problems, including health problems (Halleröd & Bask, 2008; Halleröd & Larsson, 2008). Relevant here is also studies such as the meta-analysis by Lorant et al. (2003) showing that there is a dose-response relationship between income and depression. Results from research directly analyzing individuals who are absent from work because of sickness indicate that such absence increases the risk of adverse economic and social conditions; that sick-listed individuals with economic difficulties also tend to have other problems, such as reduced wellbeing, impaired self-image, being socially isolated and inactive and that poverty and low income may have negative effects on the likelihood of returning to work (Bryngelson, 2009; Dekkers-Sánchez, 2013; Floderus, Göransson, Alexandersson, & Aronsson, 2005; Mackenzie et al., 1998; Ockander & Timpka, 2001).

Qualitative interviews with individuals being absent from work because of sickness suggest that financial strain, as a consequence of reduced incomes, can have consequences directly affecting people’s health, such as having to switch to cheaper and less nutritious food or not being able to take part in activities beneficial for their health, as well as making them feel more insecure overall and lowering their self-esteem (Jansson & Björklund, 2007). Of particular interest in this context is Anema et al. (2009), who studied how disability benefit policies affected sustainable return to work (RTW, defined as in employment after two years) for people with chronic back pain in six wealthy countries. They conclude that “cross-country
differences in eligibility criteria for entitlement to long-term and/or partial disability benefits contributed to the observed differences in sustainable RTW rates: less strict criteria are more effective” (Anema et al., 2009, p. 419).

To summarize: whereas the epidemiological approach tends to view ill-health as the prime determinant of work absence, the economic approach attributes greater significance to individual decision making and claims that individuals have significant latitude over the decision whether to go to work or report sick. Within this realm of individual decision making, economic incentives, as provided by sickness benefits, are of crucial importance as they will affect the relative costs of staying home as opposed to attending work. This leads to the first hypothesis:

**H1.** There is a positive and direct relationship between the generosity of sickness benefits (at $t_1$) and sickness absence (at $t_1$).

According to the theories rooted in the neo-classical perspective that have emphasized the dynamic and long-run relationship between the welfare state and sickness benefits, generous sickness benefits will also erode social norms over time and the disincentive effects of sickness benefits will therefore, materialize with a time lag. Thus:

**H2.** There is a long-term positive relationship between the generosity of sickness benefits (at $t_{-1}$) and sickness absence (at $t_1$).

A contrasting view on the role of sickness benefits is provided by combining the epidemiological approach to sickness absence with a so-called resource-based approach to welfare. According to this perspective, sickness absence is primarily determined by the health status of individuals. Whereas sickness benefits will have little influence on who reports sick, such collective resources may be beneficial for people in order to recuperate from illness. Therefore:
H3. There is a negative long-run relationship between the generosity of sickness benefits (at $t_{-1}$) and sickness absence (at $t_1$).

According to the epidemiological/welfare resource perspective, we also expect access to collective resources such as sickness benefits to be more important for disadvantaged social groups, such as groups already characterized by poor health. Therefore:

H4: The negative long-run relationship between the generosity of sickness benefits (at $t_{-1}$) and sickness absence (at $t_1$) is stronger for social groups with high levels of sickness absence (at $t_{-1}$).

Data and Methods

Analytical Approach

The empirical strategy used in this study is to use cross-sectional individual-level data from the EU labour force surveys (EU-LFS) for 20 countries for the years 1992-2011. From these, we construct so-called synthetic cohorts and then combine this data with country-level data on sickness benefits for the same set of countries and years. The essential idea in the synthetic cohort approach is to group individuals sharing some common characteristics – in the present case, year of birth, gender and educational level - into cohorts, after which the averages within these cohorts are treated as observations in a pseudo-panel. The obvious drawback with repeated cross-sectional data is that the same individuals are not followed over time. On the other hand, repeated cross-sections suffer less from problems pertaining to genuine individual-level panel data such as attrition, nonresponse and measurement error (Verbeek, 2008). The focus of this paper is the effect of macro-social conditions (i.e., sickness benefits) on sickness absence (an individual-level outcome). In relation to previous cross-national studies, which have used aggregate measures of sickness benefits and absence at the
country level (see e.g., Osterkamp & Röhn, 2007), the approach used in this paper is a major step forward as it also provides panel data at the level of sociodemographic groups. One of the first to propose the use of pseudo-panels was Deaton (1985). An overview of different pseudo-panel approaches is found in Verbeek and Vella (2005).

Ideally, synthetic cohorts should be constructed on the basis of time-constant and randomly distributed characteristics (typically year of birth and gender). However, there is also a trade-off between the number of cohorts and the number of individuals within cohorts. If individuals are allocated into a large number of cohorts, there will be few observations in the cohorts which might cause biased estimators. On the other hand, if only a few cohorts are chosen to have a large number of observations per cohort, individuals within a cohort might be heterogeneous, which will cause inefficiency. Thus, the challenge when constructing a pseudo-panel is finding a balance between the number of cohorts and the number of individuals within cohorts. Verbeek and Nijman (1992) showed that if cohorts contain at least 100 individuals and there is sufficient time variation in the cohort means, the bias due to measurement error would be small and can be ignored.

This article uses an $8 \times 3 \times 2$ classification of cohort based on year of birth, education and gender that yields 48 separate sociodemographic groups within each country and year. Although education is not a time-constant characteristic, it can be argued that individuals with comparable levels of education also face similar health risks and have access to similar individual resources to cope with these risks (see e.g., Eriksson & Goldthorpe, 1992). Education refers to the highest level of education or training that the respondent has successfully completed according to the International Standard Classification of Education (ISCED) 1997, and is grouped into (i) lower secondary education or below (ISCED 0-2); (ii) upper secondary and post-secondary non-tertiary education (ISCED 3-4); and (iii) tertiary education completed (ISCED 5-6). An important restriction in the EU-LFS
data is that age is only available in five-year intervals, which also mean that we can only observe the synthetic cohorts in five-year intervals. The analyses are restricted to respondents between 15 and 54 years of age, divided into 8 age groups: 15-19; 20-24; 25-29; 30-34; 35-39; 40-44; 45-49; and 50-54 years of age.

48 socio-economics groups over a period of 20 years will theoretically result in 960 observations per country. However, as we want to follow these groups over time, we need at least two observations per group. For example, respondents born between 1938 and 1942 can only be observed one year, in 1992 (when they are 50-54 years of age), since they thereafter will be too old to be included in the sample. Likewise, respondents born between 1988 and 1992 can only be observed one time, in 2007 (when they are between 15 and 19 years of age), as we have no data for 2012 when this cohort is between 20-24 years of age. Moreover, because we are interested in the lagged effect of sickness benefits, the first observation for each group cannot be used in the analyses. Table 1 depicts the number of observations for each country and the unique number of synthetic cohorts that can be observed three and four times in each country.

Of primary interest in this paper is the direct and lagged effect of sickness benefits, a variable that however is likely to be correlated with unobserved characteristics of countries (e.g., health care and rehabilitation measures) that may also affect sickness absence rates. To isolate the effect of sickness benefits from the effect of omitted country-specific characteristics that are correlated with the observed country-level variables, this paper uses an approach proposed by Jaeger (2013). This approach is best described by using a familiar linear regression framework (see Equation 1).

$$S_{ijt} = \alpha + x_{ijt}\beta_1 + z_{jt}\beta_2 + SB_{jt}\beta_3 + SB_{j,t-1}\beta_4 + SB_{j,t-1} * S_{ij,t-1}\beta_5 + c_j + \delta_{ij} + \epsilon_{ijt} \quad (1)$$
where $S_{ijt}$ is sickness absence in socioeconomic group $i$ ($i = 1, \ldots, N$) in country $j$ ($j = 1, \ldots, 20$) in at time $t$ (1997, \ldots, 2011). $x_{ijt}$ is a vector of group-specific variables which vary both across groups, countries, and over time, and $z_{jt}$ is a vector of country-level control variables which vary across countries and over time.

The direct effect of sickness benefits (SB) implied by hypothesis 1 is captured by the regression coefficient $\beta_3$. The long-run effects of sickness benefits implied by hypothesis 2 (a positive effect) and hypothesis 3 (a negative effect) is captured by the regression coefficient $\beta_4$. Hypothesis 4, stating that access to and the generosity of collective resources such as sickness benefits will be more important for groups characterized by high levels of sickness absence at $t_{-1}$, implies an interaction effect so that sickness absence at $t_1$ will depend on the interaction of sickness absence and sickness benefit generosity at $t_{-1}$ ($SB_{j,t-1} \times S_{ij,t-1}$). This effect, $\beta_5$, is assessed by means of stratified analyses, where the groups within each country was divided into groups with no, low, medium and high levels of sickness absence at $t_{-1}$. Finally, the model also includes the overall intercept $\alpha$, the country-specific effects $c_j$, the group-specific effects $\delta_{ij}$ and the residual error-term term $\epsilon_{ijt}$.

Equation 1 addresses the problem of omitted variable bias at the country and cohort level by controlling directly for the cohort- and country-specific effects ($\delta_{ij}$ and $c_j$). For computational simplicity, the cohort fixed effects ($\delta_{ij}$) are controlled for by so-called within-group transformation of the data at the group level. By replacing the original cohort value by the deviation from the cohort-specific overall mean, we obtained the same result as including dummy variables for each sociodemographic group in equation 1. Equation 1 can then be estimated by including the within-group transformed group-level variables together with the country-level time-varying covariates and country-level fixed effects. The models were
estimated with cluster-robust standard errors to take into account the clustered nature of the data.

Because these dependent variables are counts (see below) and a sizeable proportion of the synthetic cohorts have zero values on the dependent variable, negative binomial regression models were used (Hilbe, 2011). This specification ensures that zero values of the dependent variable are incorporated into the model rather than implying a truncation as in OLS regression. The negative binomial regression model can be considered as a generalization of the Poisson regression, but whereas Poisson models assume that the conditional mean and variance of the distribution are equal, negative binomial regression models do not assume an equal mean and variance and has an extra parameter to model the over-dispersion of the data. Deviance tests indicated that the negative binomial specification significantly outperformed the Poisson specification. The results of equation 1 and its extensions are reported as incidence rate ratios (IRR). The IRR represents the percentage change in the dependent variable resulting from a one-unit change in the independent variable.

Data

The data used in this paper is the European Union Labour Force Surveys (EU-LFS) for the years 1992-2011. The EU-LFS provides harmonized cross-sectional information on individuals compiled from national labour force surveys. About 1.5 million people per quarter is interviewed in total in the EU, and the EU-LFS is the main source for labour market analyses in Europe. The comparability of data is high (Charlier & Franco, 2001; Mazzuco & Suhrcke, 2010). The EU-LFS covers a longer time period and provides a much higher number of observations than other European surveys, thereby, allowing researchers to obtain reliable estimates including relatively rare outcomes, such as sickness absence. 20 countries are included in the analyses (Austria, Belgium, the Czech republic, Denmark, Finland, France,
Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, and the UK). The availability of EU-LFS data is shown in Table 1 (column 2).

**Measures and Variables**

In the EU-LFS, respondents are asked for reasons they are not working or working less than usual during the reference week. Based on these questions, several indices of health-related absence can be calculated (Mazzuco & Suhrcke, 2010). The main purpose of sickness benefits is to replace lost earnings for workers who are unable to work because of temporary illness. The question most accurately measuring this, and the first dependent variable used in the analyses, is temporary reduction in working ability (TRWA), defined as the number of persons who worked less than usual due to illness, injury or temporary disability during the reference week. However, sickness benefits also aim to replace lost earnings for somewhat longer absence spells, i.e., respondents who did not work at all during the reference week because of health problems. The second dependent variable will therefore, in addition to temporary reduction in working ability (TRWA), include temporary inability to work (TIW), defined as the number of respondents who stated that they did not work at all in the reference week, despite having a job, due to health problems (i.e., TRWA + TIW). One important restriction on these indices is that there is no information on the severity of the referred health problems.

The central independent variable at the country level is the generosity of sickness benefit schemes. While government spending is often used as a proxy for the generosity of different welfare programs, scholars have increasingly come to recognize the inappropriateness of such measures due to the fact that spending is often countercyclical and heavily influenced by the demographic composition of the population. Therefore, increased
aggregate spending can coexist with lower individual entitlements (Ferrarini, Nelson, Korpi, & Palme, 2013). We are therefore using institutional data from the Welfare State Entitlements dataset (Scruggs, Jahn, & Kuitto, 2014a) that focuses on qualifying conditions and the generosity and duration of sickness benefits. More specifically, this paper used an additive index of the following characteristics of nationally legislated sickness benefit schemes: (i) replacement rate (percent of previous wage), defined as amount of sickness benefits payable to an unmarried person earning the average production worker wage (less taxes) compared with the post-tax average production worker (APW) income; (ii) benefit duration (maximum weeks of benefit payment); (iii) qualifying conditions (weeks of employment needed to qualify for benefit); and (iv) coverage (the share of the labour force insured for benefits) (see Scruggs et al., 2014b). The average replacement rate was 73.9%, the average coverage rate was 87.4%, the average qualification period was 41.4 weeks and the average duration of benefits was 80.4 weeks over the period studied here. Both the duration of benefits and qualification period was top-coded at 156 (i.e., three years). After reversing the values on the qualifying period indicator, these four indicators were standardized according to the maximum value in the whole sample and summed to an index that theoretically ranges from zero to four. The availability of sickness benefit data is depicted in Table 1, column 3, and the mean and standard deviations of the sickness benefit index is depicted in column 8.

The regression models also includes a number of covariates identified by previous research as important for understanding variations in sickness absence rates across countries and over time (see e.g., Livanos & Zangelidis, 2012; Osterkamp & Röhn, 2007). The unemployment rate have been identified as crucial for understanding the development of sickness absence, as high unemployment rates might discipline employees to be absent from work less often for fear of losing their jobs. However, as low unemployment may be a result of high economic growth, which can raise the demands and work load on employees and
thereby, elevating the risk of sickness absence, the models will includes GDP growth per capita (ppp-adjusted). All models also included a control for labour force participation (16-64 years) to take into account compositional differences between national labour markets.

The availability of individual-level variables differ between countries and years in the EU-LFS. In order to maximize the sample size, the following covariates were entered at the cohort level. A measure of work contract, separating respondents with temporary and permanent contracts, were included as workers with temporary contracts might enjoy less job security and larger penalties for reporting sick. Hours usually worked was also included as an important reason for working less than full time might be poor health. Finally, the proportion in the cohort that were inactive (i.e., persons who were neither employed nor unemployed) also served to control for health-related selection into the labour market at the cohort level. Unfortunately, income was not available in the EU-LFS data for the time period of this study.

Results

Table 1 depicts average values on the sickness benefit generosity index and the two measures of sickness absence; temporary reduction in working ability (TRWA) and TRWA plus temporary inability to work (TRWA + TIW). Generally, countries in northern Europe such as Sweden, Norway, and Finland, as well as some Continental-European countries such as France, the Netherlands and Germany are characterized by having relatively generous sickness benefits, and many of these countries also have a history of high sickness absence levels. The correlation between sickness benefit generosity and temporary reduction in working ability is 0.43, and the correlation between sickness benefit generosity and temporary reduction in working ability plus temporary inability to work is 0.55. However, the magnitude of these correlations is heavily influenced by three countries – Sweden, Norway and the Netherlands - that score high on both the sickness benefit generosity index and the two
measures of sickness absence. If these three countries are excluded, the aforementioned correlations are reduced to -0.10 and 0.23, respectively.

As indicated by the reported standard deviations, sickness absence rates also display considerable variation over time. However, trends over time differ substantially between countries. For example, in Norway there was a sharp increase in sickness absence rates between 2005 and 2009, whereas there was a marked reduction in absence rates between 2006 and 2009 in neighboring country Sweden after a period of increasing absence rates in the early 2000s. Also Denmark witnessed a marked increase in sickness absence rates in the mid-2000s followed by a marked decrease in absence rates after 2007. In the Netherlands, there was a sharp decrease in absence rates in the early 2000s, and after a small increase in the mid-2000s, this downwards trend continued in the late 2000s. In other countries, such as Finland, there are relatively large year-to-year variations but with no clear trend over time.

>> Table 1 about here <<

Table 2 depicts the results from the negative binomial regression models with the two measures of sickness absence (TRWA and TRWA+TIW) as dependent variables. Although the incidence rate ratio for the direct effect of sickness benefit generosity (column 1) is larger than one (indicating that higher benefit generosity is associated with higher absence), the reported coefficient is not significantly different from one. However, the incidence rate ratio associated with lagged sickness benefit generosity is, however, significantly smaller than one (model 2) which indicates that more generous benefits at \( t_{-1} \) is associated with lower levels of sickness absence at \( t_1 \). The incidence rate ratios are roughly similar when only lagged benefit generosity is included (model 2) or combined with present levels of benefit generosity (model
The incidence rate ratios are also roughly similar for both measures of sickness absence (TRWA, model 3 and TRWA+TIW, model 4). These incidence rate ratios indicate that a one-unit increase in the sickness benefit index at $t_{-1}$ is associated with a reduction in sickness absence of between 31-36% at $t_1$ (i.e., five years later). Although a one-unit increase in the sickness benefit index is very substantial change, Table 1 indicates that such changes are not implausible. Sweden has the highest average score on the sickness benefit index (3.695), and roughly one unit below Sweden we find Italy (2.606). To reach the average score of Sweden on the sickness benefit index, Italy would have to substantially increase the duration of benefits (from 26 weeks to 156 weeks), increase the replacement rate somewhat (from 76.1 to 80.6%) and increase the coverage of sickness benefits from 66.7 to 88.9% (both Sweden and Italy have no qualification period).

Similarly, Greece has the lowest score on the sickness benefit index (1.955), and roughly one unit higher on this index we find the Czech Republic. To reach the average score of the Czech Republic on the sickness benefit index, Greece would have to increase coverage and replacement rate from 64.4 to 83.6% and from 67.3 to 77.8%, respectively (but simultaneously also being able to reduce the qualification period from 156 to 78 weeks).

Of the other country-level variables, only unemployment has a significant incidence rate ratio lower than one, providing support for the argument that there is a disciplinary effect of unemployment on sickness absence. The group-level variables suggest that past sickness absence is strongly related to present levels of sickness absence. For example, groups defined as having medium levels of temporary reduction in working ability (TWRA) at $t_{-1}$ have about
12% higher levels of TWRA at $t_1$, and groups defined as having high levels of TRWA at $t_{-1}$ have around 20% higher TRWA at $t_1$. The patterns are roughly similar when temporary inability to work (TIW) is also included in the dependent variable. However, with only TRWA as the dependent variable, there is no significant difference between groups with no TIW at $t_{-1}$ and groups defined as having high levels of TIW at $t_{-1}$. One possible reason for this is that individuals in groups with high TIW at $t_{-1}$ are not found in the labor force five years later.

Figure 1 presents the results from the stratified analyses, where model 3 and 4 (see Table 1) are estimated on groups defined at $t_{-1}$ as having no, low, medium or high levels of sickness absence (i.e., the same groups as those in Table 2). For the argument that sickness benefits as a collective resource are of special importance for more vulnerable groups to be convincing, the stratified analyses should result in a stronger effect of the sickness benefit generosity in groups with a history of high sickness absence.

The first thing to note from these stratified analyses is that the incidence rate ratio for present levels of sickness benefit generosity is significantly larger than one in groups having no temporary reduction in working ability (TRWA) at $t_{-1}$ (IRR = 2.806; 95% CI[1.067 - 7.376]). This result can be interpreted as support for the neo-classical hypotheses that generous sickness benefits can provide economic incentives for individuals to report sick when their ailment does not represent a strict medical hindrance for attending work. However, the incidence rate ratios for groups with low to high levels of temporary reduction in working
ability at $t_{-1}$ are not significant. In these groups, and especially in the groups defined as having medium and high levels of temporary reduction in working ability at $t_{-1}$, more generous sickness benefits appears instead to lower the risk of sickness absence five years later. These results are largely supportive of the hypothesis derived from the epidemiological/welfare resource perspective.

Also for models with TWRA plus TIW as the dependent variable (Figure 2, lower panel), the incidence rate ratios are significantly lower than one for groups with low to high levels of sickness absence at $t_{-1}$: for these groups, sickness benefit generosity at $t_{-1}$ is associated with $28 – 43\%$ lower sickness absence at $t_1$. The incidence rate ratio for groups having no sickness absence at $t_{-1}$ is, however, not significantly different from one. Moreover, sickness benefit generosity at $t_1$ has no significant effect on sickness absence at $t_1$ (the dashed line).

The fact that sickness benefit generosity appears to have long-run effects on sickness absence also has implications for reforms to sickness benefits. Figure 2 presents results from a simple simulation exercise based on predicted values from an extended version of equation 1. In this model, sickness absence at $t_1$ is seen as a function of current and past levels of sickness benefit generosity ($\beta_1$ and $\beta_2$ respectively), the interaction of current and past levels of sickness benefit generosity with sickness absence at $t_{-1}$ ($\beta_3$ and $\beta_4$ respectively) and the main effect of sickness absence at $t_{-1}$ ($\beta_5$; equation 2). Otherwise equation 2 contains the exact same group- and country-level variables as equation 1.

$$\hat{S}_{ijt} = SB_{jt}\beta_1 + SB_{jt-1}\beta_2 + SB_{j,t-1} * S_{ij,t-1}\beta_3 + SB_{jt} * S_{ij,t-1}\beta_4 + S_{ij,t-1}\beta_5 \quad (2)$$

I is important to point out that equation 2 should not be interpreted as a full-fledged simulation – for example, sickness absence at both $t_{-1}$ and $t_1$ is likely to have group-level
effects on labour market behaviour as well as to stimulate policy response that is not accounted for by this simple, static model.

Here, we mimic a situation where a country reduces sickness benefit generosity from the highest observed value on the sickness benefit index (3.695) at $t_1$ to the lowest observed value on this index (1.955) at $t_2$. The lagged value of sickness benefit generosity at $t_2$ will still be at a high level (3.695). Only a $t_3$ have also the lagged value of sickness benefit generosity reached a low level (1.955).

Figure 2 indicates that a reduction in sickness benefit generosity at $t_1$ is associated with a substantial decrease in predicted rates of temporary reduction in working ability (TRWA) at $t_2$, especially for groups with relatively high levels of sickness absence at $t_1$. However, reform would only have substantial effects for groups with no sickness absence at $t_1$. Yet, the negative lagged effect of sickness benefit generosity (as indicated in Table 2 and Figure 2) means that once benefit generosity is at a lower level, it will in fact increase sickness absence rates. At $t_3$, when both current and lagged values of the sickness benefit generosity index is at a low level, predicted values of temporary reduction in working ability is therefore back at levels comparable to those prevailing at $t_1$.

The dynamic effect of a reduction in sickness benefit generosity on predicted values of temporary reduction in working ability plus temporary inability to work (TRWA + TIW) is perhaps even more striking. Due to the fact that current levels of benefit generosity has little effect on sickness absence rates (as indicated in Table 2 and Figure 2), a reduction of benefit generosity
generosity has negligible effects on sickness absence rates at \( t_2 \). However, as indicated by previous results that there is a negative effect of lagged benefit generosity on sickness absence, predicted absence rates will increase at \( t_3 \). 

**Discussion**

The analyses of the relationship between sickness benefits and sickness absence has for long been dominated by the view that such benefits provide powerful incentives for people to report sick or to stay on benefits longer than needed for strict medical reasons. This could have a detrimental effect both at the societal level - by rising public expenditures and lowering the tax base – and at the individual level, as sickness absence may lead to labour market marginalization and subsequent economic, social and health deprivation. This paper outlines a possible alternative interpretation of this relationship. By combining an epidemiological approach to sickness absence, which essentially maintains that sickness absence is not so much the outcome of a rational decision-making process as the result of actual ill-health, with a resource-based approach to welfare, this paper argues that access to collective resources providing economic support during times of ill-health may be of importance for individual health trajectories and for people’s possibility to recuperate from illness, especially for more vulnerable social groups already characterized by poor health.

The empirical analyses provides support for both of these views on the relationship between sickness benefits and sickness absence. The results do not support the hypothesis that socioeconomic groups in countries with more generous sickness benefits have, on average, higher sickness absence. Rather, the generosity of sickness benefits in the past is associated with lower current levels of sickness absence. This may be interpreted as to indicate that more generous benefits helps people to cope with the adverse economic and social conditions often associated with sickness, thereby helping them to recover from illness and leading to lower
current levels of sickness absence. However, the results also indicate that for socioeconomic
groups with no sickness absence in the past, current levels of sickness benefit generosity is
associated with higher levels of sickness absence. This is an important result, as a significant
proportion of the socioeconomic groups analysed at a given year have no sickness absence in
the past. However, for socioeconomic groups who have experienced sickness absence in the
past, more generous sickness benefits at the time when they were absent is associated with
lower current levels of sickness absence.

The finding that sickness benefit generosity appears to have a lagged, negative effect
on absence rates also has important implications for reforms to sickness benefit systems.
Whereas a reduction in sickness benefit generosity at $t_1$ is associated with a decrease in short-
term sickness absence rates at $t_2$, especially for groups who have experienced sickness
absence in the past, at $t_3$, absence rates tend to be back at the prevailing levels at $t_1$. The long-
run positive effect on sickness absence of a reduction in sickness benefit generosity is even
more pronounced when also taking into account more long-term absence.

There are a number of important caveats to these results and conclusions. First, we
have only analysed short-term absence. I may very well be that the conclusions would be
different if we analysed in- and outflow into more long-term sickness absence and disability.
Secondly, our measure of sickness benefit systems is (by necessity) rather simple, and there
are a number of other features of sickness benefit systems that probably are of importance for
sickness absence rates. Especially the role of so-called gate-keepers, i.e., social insurance
officers that decide whether or not to grant benefits and ascertaining whether further measures
are needed to facilitate return to work (Söderberg & Alexandersson, 2005), are probably of
importance for cross-national differences in sickness absence. However, no comparable data
on the role of gate-keepers is available. Also worth highlighting is that the fixed-effect
approach used in this paper (at least partly) controls for this, as it isolates the effects of
sickness benefits from the effects of omitted country-specific characteristics (such as gatekeepers) that are correlated with the observed country-level variables. Thirdly, the approach used in this paper, where socioeconomic groups form repeated cross-sections of pseudo-panels that are followed over time, is only a partial substitute for individual-level time-series data. However, there are also a number of advantages to this approach compared to individual-level data (e.g., attrition, nonresponse and measurement error). The data used here must be considered to be a major step forward in relation to other cross-national analyses that have relied on cross-sectional or time-series data aggregated at the country level. Notwithstanding these cautions and limitations, this paper nevertheless highlights the fruitfulness of applying alternative theoretical approaches to the relationship between sickness benefits and sickness absence as well as the need of separating short- and long-run effects of reforms to social protection systems.
References


## Table 1

**Descriptive Statistics**

<table>
<thead>
<tr>
<th>EU-LFS data</th>
<th>Sickness benefit data</th>
<th>No. of observations</th>
<th>No. of cohorts observed 3 times</th>
<th>No. of cohorts observed 4 times</th>
<th>Median number of individuals in cohorts</th>
<th>$M(SD)$, sickness benefit index</th>
<th>$M(SD)$, temporary reduction in working ability (TRWA) plus temporary inability to work (TIW)</th>
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<tr>
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<td>254</td>
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<td>1992-2011</td>
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<td>230</td>
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<tr>
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<td>1992-2011</td>
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<td>256</td>
<td>171</td>
<td>354</td>
<td>3,042 (0,012)</td>
<td>0,0071 (0,0044)</td>
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<td>354</td>
<td>1637</td>
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<td>0,0037 (0,0018)</td>
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<tr>
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<td>0</td>
<td>301</td>
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<td>1992-1993; 96-00; 02-11</td>
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<td>87</td>
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<td>772</td>
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<td>1992-2011</td>
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<td>310</td>
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<td>252</td>
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<td>304</td>
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<td>2,850</td>
<td>0,0056 (0,0056)</td>
<td>0,0189 (0,0090)</td>
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**Note.** Mean TRWA and TRWA+TIW is the count of individuals who are absent due to sickness divided by cohort size.
### Table 2

**Negative Binomial Models with Robust Standard Errors**

<table>
<thead>
<tr>
<th></th>
<th>Temporary reduction in working ability (TRWA)</th>
<th>Temporary inability to work (TIW) + TRWA</th>
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<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
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<tr>
<td><strong>Country-level variables</strong></td>
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<td></td>
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<tr>
<td>Sickness benefits</td>
<td>1.461</td>
<td>1.626</td>
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<td>(0.845 - 2.526)</td>
<td>(0.905 - 2.923)</td>
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<td>Sickness benefits lagged</td>
<td>0.692</td>
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<td></td>
<td>(0.507 - 0.944)</td>
<td>(0.451 - 0.918)</td>
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<td>Unemployment</td>
<td>0.960</td>
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<td>(0.944 - 0.976)</td>
<td>(0.946 - 0.976)</td>
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<tr>
<td>GDP</td>
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<td>1.000</td>
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<tr>
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<td>(0.975 - 1.026)</td>
<td>(0.976 - 1.026)</td>
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<tr>
<td>Labour force participation</td>
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<td>1.039</td>
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<td>(0.968 - 1.086)</td>
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<td><strong>Group-level variables</strong></td>
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<td>TRWA lagged (no=ref)</td>
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<td>(0.994 - 1.189)</td>
<td>(0.997 - 1.189)</td>
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<td>(1.043 - 1.208)</td>
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<tr>
<td></td>
<td>(1.111 - 1.297)</td>
<td>(1.108 - 1.286)</td>
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<td>TIW (no=ref)</td>
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<td>(1.093 - 1.483)</td>
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<td>(1.222 - 1.616)</td>
<td>(1.221 - 1.612)</td>
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<td>High</td>
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<td>1.425</td>
</tr>
<tr>
<td></td>
<td>(1.240 - 1.661)</td>
<td>(1.235 - 1.645)</td>
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<tr>
<td>TIW lagged (no=ref)</td>
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<td>(1.028 - 1.320)</td>
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<tr>
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<td>1.218</td>
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<td></td>
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<td>(1.069 - 1.388)</td>
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<tr>
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<td>1.157</td>
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<tr>
<td></td>
<td>(0.996 - 1.338)</td>
<td>(0.998 - 1.342)</td>
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<td>Inactivity</td>
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<td>1.146</td>
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<td>(0.722 - 1.822)</td>
<td>(0.723 - 1.816)</td>
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<td>Hours usually worked</td>
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<td></td>
<td>(0.989 - 1.022)</td>
<td>(0.991 - 1.022)</td>
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*Note.* Incidence rate ratios with 95% confidence intervals within parenthesis (significant coefficients in bold).
Figure 1. Stratified analysis. The effect of sickness benefit generosity (t₁) and lagged sickness benefit generosity (t₋₁) on sickness at t₁ according to levels of sickness absence at t₋₁ (no, low, medium, high).

**Temporary reduction in working ability (TRWA)**

![Graph showing the effect of sickness benefit generosity on temporary reduction in working ability.](image)

**Temporary reduction in working ability (TRWA) plus temporary inability to work (TIW)**

![Graph showing the effect of sickness benefit generosity on temporary reduction in working ability plus temporary inability to work.](image)
Figure 2. Effects of a reduction in sickness benefit generosity (at t₁) on predicted sickness absence rates.

Temporary reduction in working ability (TRWA)

Temporary reduction in working ability (TRWA) plus temporary inability to work (TIW)