Sick Pay Insurance and Sickness Absence: Some Cross-Country Observations and a Review of Previous Research

by

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1. Introduction

In the European Labour Force Surveys the respondents are asked what they did the week before the survey was done. For those who were employed, the share of respondents who replied they were absent from work due to sickness for the entire week varies substantially between different European countries. Calculated as an average in the age group 25-64 this share is largest in Norway at 3.0 percent, Sweden (2.5 percent) and the Netherlands (2.1 percent); and smallest in Italy at 0.6 percent, Ireland (0.9 percent) and Switzerland (1.2 percent). Although it is hard to calculate the exact cost of this form of absence to society, or at what level an "optimal" work absence rate should be, it is obvious that that the cost is very large, since foregone production is likely to be proportional to the share of absent workers.

Most of the unplanned work absence in European countries is financed through public sickpay insurance programs. A common problem for these programs is that health status is not fully observable for the insurer – in particular not in relation to the health requirement of the insured worker's regular work. At some health states, it is obvious that the worker is unable to do his or her work. Similarly, if the worker is perfectly well, it is obvious that he or she could perform the work. Between these states there is, however, a "gray zone" of health states where the worker could do his or her work, but to cost of a larger effort than would be required if he or she would have been well. I addition to that, if the worker values leisure, the observability problem implies that he or she could lie about his or her health status in order to receive temporary benefits from the sickpay insurance while the worker enjoys time off.

The observability problem implies that it is not possible to formulate a comprehensive insurance contract that perfectly regulates the utilization of the program. There is a possibility of *moral hazard* in the utilization of the insurance, which means that the formulation of the insurance contract affects the behavior of the insured workers. If the insurer for instance provides full insurance it will lead to over-utilization of the insurance. To avoid this, the insured worker can take over some of the risk, meaning that the sickpay insurance would not provide full compensation.

The sickpay insurance programs in the European countries show that there are different possibilities for the insurer to share some of the risk with the insured worker in order to avoid over-utilization. The replacement rate could be less than 100 percent of forgone earnings; there could be "waiting days" in the absence spell before the insured worker is eligible for benefits; there could be limitations to the duration of replacement. In addition the that, the government could mandate to the employers to organize a the insurance.

The overall aim of this paper is to give an overview of how the design of the sickpay insurance affects sickness-absence behavior. We do this by first comparing stylized features of sickpay insurance programs in 15 different European countries with the absence rates in these countries. Data on work absence rates are obtained from the Labour Force Survey from the different countries provided by Eurostat. Data for the stylized features of the sickpay insurance program are obtained from the *Social Citizenship Indicator Program* (SCIP) and its sequel *Social Policy INdicator* (SPIN). In addition to that we also summarize previous

research, both theoretical and empirical obtained from individual data from different European countries, on this topic.

2. Some stylized facts of work absence in 15 European countries

As an introduction, it is instructive to look at some cross-country data on sickness absence. We use data assembled by Eurostat, based on the *labor force surveys* (LFS). The data were originally collected by the national statistical agencies and a respondent is classified as absent if he or she responds yes on the question, "Were you absent from work due to sickness during the entire previous week?" The great advantage of this data is the comparability between countries. It is based on a simple question with an unambiguous interpretation. It also have a high degree of reliability, since the Labour Force Surveys are collected by the national statistical agencies and are based on comparatively large samples. They are also independent of the country specific features of the sickpay insurance systems.

The data have, however, several limitations. By construction, they only cover sickness spells equal to or longer than a week. Thus total sickness absence will be underestimated for all countries – and more so for countries where short spells are relatively more frequent, while it will be less underestimated for countries where long spells dominate. In addition, as pointed out by Berge, Johannessen and Næsheim (2012) and Proba (2014), the measured duration of sickness spells varies between countries as a result of the maximum spell length covered by the sickpay insurance being different. These differences affect for how long the worker in a sickness spell is able to remain employed. Since workers in all countries are more likely to leave the labor force after terminating a maximum duration spell, the absence rate in countries with long maximum spell lengths tend to be overestimated. Berge et al. (2012) and Proba (2014) also point out that there may be a discrepancy between weeks and hours of work absence measured in the Labor Force Surveys because of partial work absence.

Individual countries have data on the number of days financed by national sickpay insurance systems, and in case there is no comprehensive national system, there are data from individual insurers. But since these systems differ in many respects, they are in our view less comparable than the data obtained from the Labor Force Surveys. For instance, some systems pay benefits only for absence exceeding a *waiting period*, while shorter spells of sickness are either not paid for at all, or are paid by the individual's employer.

Figure 1 shows the yearly sickness absence, as a percentage of the labor force, for 15 European countries. To make the diagrams easier to view, we have divided the countries (according to alphabetical order) into two groups, each shown in a separate panel of the figure. From the upper panel, we see that Ireland has always had a relatively low sickness absence, varying between 0.5 and 1.0 percent, while for instance Belgium, France and Germany have had higher absence rates (in 2017 above than 2 percent.

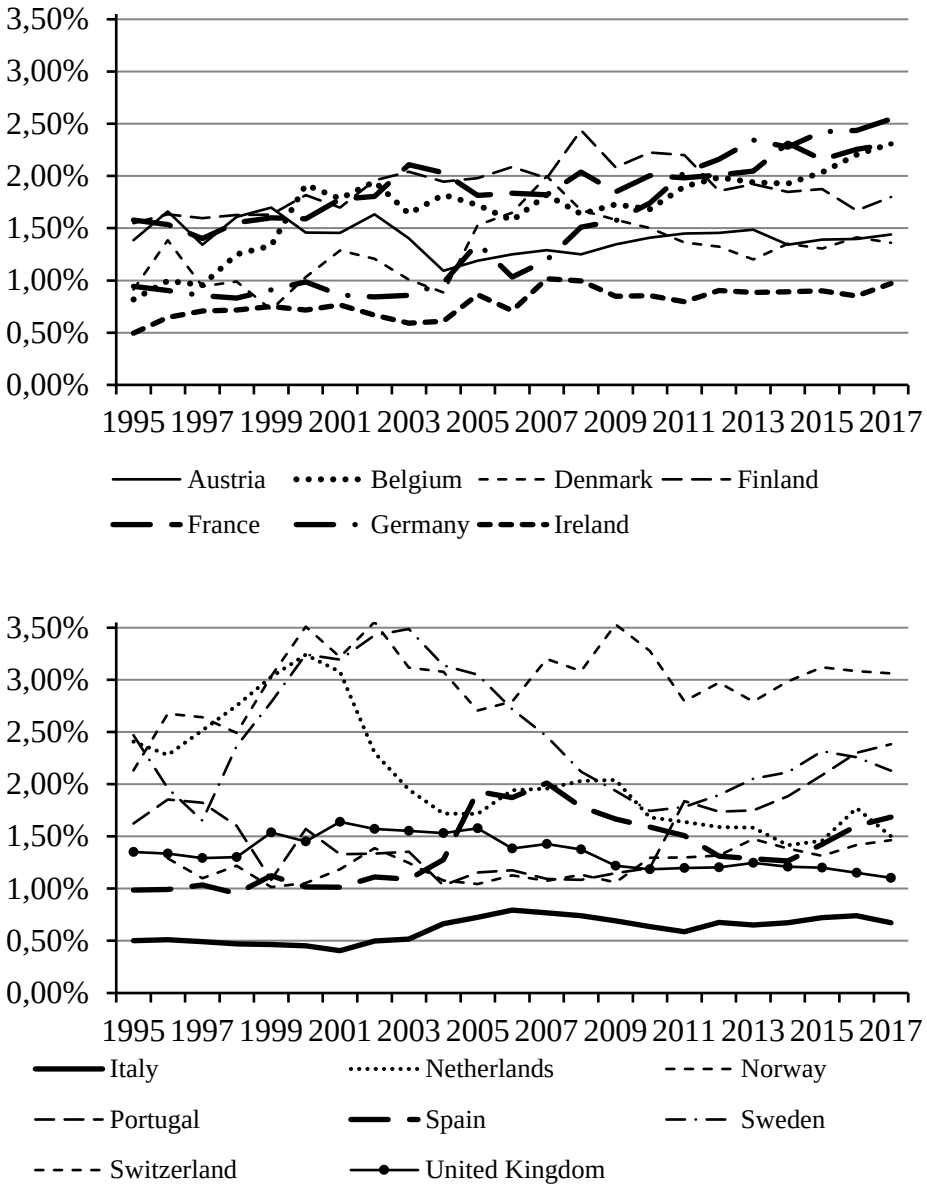


Figure 1: Sickness absence in 15 European countries, 1995-2017.
Source: Eurostat, LFS.

In the lower panel we see some even more extreme cases. Italy is the leading country in terms of low absence: only half a percent of the labor force. At the other extreme, Norway has had an absence rate of around 3 percent for two decades.

We also see that some countries display clear *upward trends* in their absence rates; these are France, Germany, Ireland, Italy and Spain. For each country, we have defined an upward trend by running a linear regression of absence against time; if the estimated coefficient is positive, and significant at the 1-percent level, the country is said to display an upward trend. These countries are indicated by warning signs in the form of thick curves in the figure.

The significant upward trend for Germany illustrates the problem with the Eurostat data base. Looking at the data of one of the largest insurers in Germany, there is no such long-term trend from 1995 to 2017 (although there is a clear increase after 2006, the absence rate in 2017 is at about the same level as it was in the late 1990s).[1] The Eurostat data and the domestic data may be reconciled if there has been a shift in absence behavior, from short to long spells, without any long-term trend in the total number of absence days. Another way to reconcile the two pictures is to emphasize the fact that the domestic database only covers a part (albeit an important part) of the German labor market. To analyze in more detail what has actually happened in Germany falls outside the scope of this paper.

Those countries that do not display upward trends are indicated by thin curves in Figure 1. If the estimated time trend is negative and significant at the 1-percent level, the country is said to display a *downward trend*. In the data, only one country displays a significant negative trend – namely the Netherlands.[2] The reason why the Netherlands show a downward trend may be that already in the 1990s, there was a deep concern for the budgetary problems associated with high absence (see Bannik et al., 2006). Between 1994 and 2006, several reforms took place, aiming at active return-to-work strategies, increased employer responsibility, and stronger incentives for all agents. These reforms involved transferring the financial risk from the state to the employer (who could insure against these risks by a system of experience rating), a "Gatekeeper Protocol" regulating the employer's responsibilities for reintegration of sick employees, and assessment criteria for eligibility for sick pay. [3]

In order to get a better overview of the differences between the countries than we get in the somewhat messy Figure 1, we show in Figure 2 the average sickness absence over the period 1995 – 2017 for each of the 15 countries.

[1] See Meyer *et al*. 2018.
[2] Needless to say, the classification of countries according to time trends is sensitive to the choice of time period. We have used the time period 1995-2017 since for most countries, data are available for that period (for some countries, data are available also for the 1980s). If we, somewhat arbitrarily, had chosen the time period 2000-2017 instead, both Sweden and the Netherlands would have displayed significant negative trends – but for the 10995-2017 period, Sweden's negative trend is significant only at the 10-percent level.
[3] See de Jong (2015) for details.

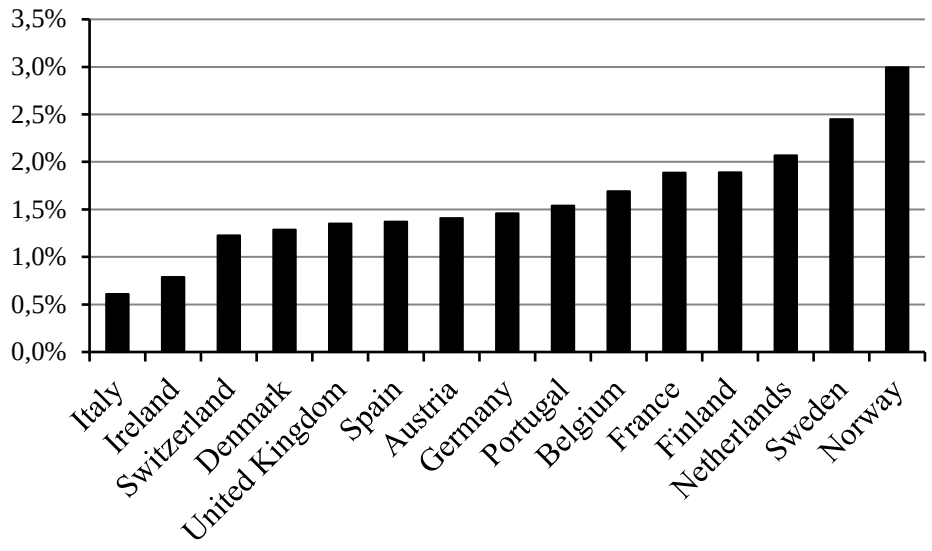


Figure 2: Average sickness absence in 15 European countries 1995-2017. Source: Eurostat, LFS

If we accept the Eurostat LFS data, we see that Italy and Ireland display the lowest averages, and that Norway and Sweden display the highest; their averages exceed those of the low-absence countries by a factor of four or five.

Even though both Norway and Sweden display high average absence, one might say that Sweden's lower rates towards the end of the period look more comforting than Norway's persistently high rates – and that the upward trends of Belgium, France and Germany look even more alarming. In fact, Sweden had very high rates around the years 2000-2003, but after a series of austerity measures implemented since 2003 the rates have fallen. The measures have mainly been of administrative character, and not really affected replacement levels (although the maximum replacement level was raised, and then lowered again, at various points in time in the period between 1995 and 2005). Examples of administrative changes are the centralization of sickpay insurance to one national authority in 2005 and the establishment of a new organization for reducing cheating and abuse of the insurance. Also, an indicative document, providing guidelines for the physicians when judging whether a patient is able to work, was issued by the insurance authority; and measures for encouraging rehabilitation, including the so-called the "Rehabilitation chain" implemented in 2008, were taken.[4] The Eurostat data for Sweden conform to Swedish domestic data sources; the general pattern shown in Figure 1 thus seems reliable for that country.

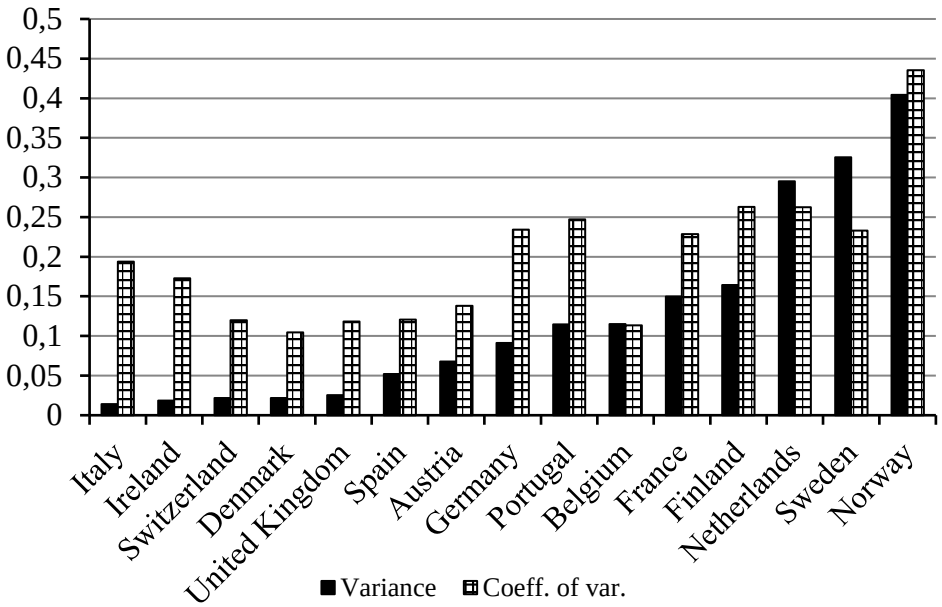
The upward trends of some countries are difficult to explain without doing detailed studies of each individual country, in particular since the Eurostat data sometimes do not always give the same picture as domestic data. The upward trends are, however, often explained by more

[4] For a survey, see Hägglund and Skogman Thoursie (2010).

generous benefits.[5] In the 2000s, no major change in the German sickness insurance system has taken place; the dramatic increase in absence shown in Figure 1 is therefore hard to explain. However, in 2007 the retirement age was raised to 67 (which makes older cohorts a larger fraction of the labor force) and a slight increase in disability benefits took place in 2014 (the "Rentenpaket"). Also, the so-called Hartz Reform, which was implemented at various stages in the 2000s and made it more difficult to obtain unemployment benefits, might have affected the number of individuals claiming sickpay benefits.

One more stylized fact of cross-country differences may be worth noting. From the time series of Figure 1, we see that the data show a rather high variability over time. The variability is of two types. One is that the absence rate varies at a relatively high frequency around a constant mean, like for Switzerland or Norway. Another is that the absence rate swings at a much lower frequency, perhaps driven by policy changes or by subtle social processes, and in the extreme cases just follows an upward or downward trend.

While it might be interesting to study what drives cyclical variations in absence, and what drives long-term trends, this question falls outside the scope of this paper. Since both types of variations may be harmful to the economy, we simply group them together and measure them by the variance across time. In Figure 3 we show the variance on the vertical axis, and the country averages of Figure 2 on the horizontal axis. We see that countries with high average absence also tend to have a high variance; running a regression line on the data of Figure 3 yields a positive, but not significant, slope.[6]



[5] Ziebarth and Karlsson (21014) analyzed a 1999 increase in German sickpay benefits and showed that the hike had a significant effect in the form of higher absence.

[6] This also holds if we use another measure of variation, namely the coefficient of variation. The relationship between averages and coefficients of variation is positive, but not significant.

Figure 3: Variation in sickness absence 1995-2017. Source: Eurostat, LFS

In general, countries with a high average absence also display a high variance. Figure 4 shows the absence rate on the horizontal axis and the variance on the vertical axis; the positive correlation between the two series is evident, but only barely significant ($t = 1.73$; $p = 0.107$). If we instead regress the coefficient of variation against the average, we still get a positive correlation, albeit statistically insignificant (not shown in the paper).

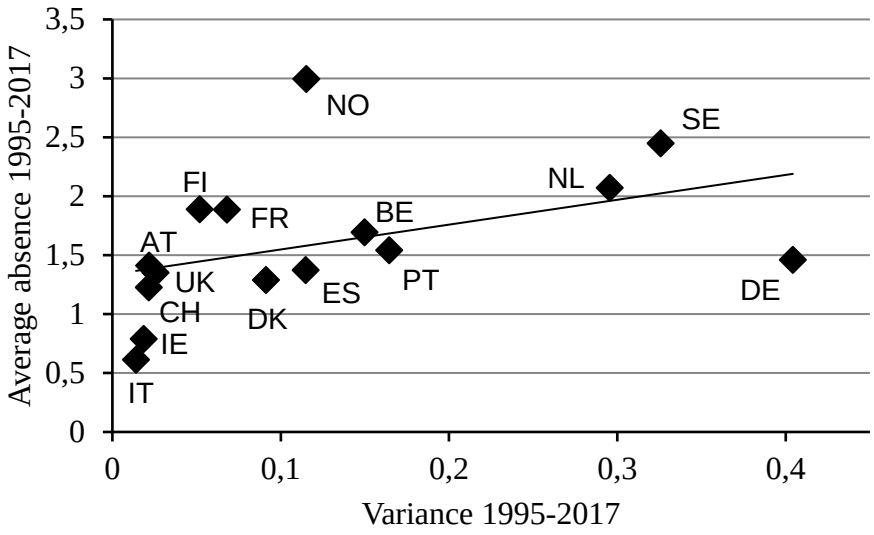


Figure 4: Average sickness absence and the variation in absence 1995-2017. Source: Eurostat, LFS.

3. What drives sickness absence?

One may conceive of four different factors behind aggregate of sickness absence, namely health, the composition of the labor force, institutions (i.e., benefits and the like), and norms and attitudes. In this section, we will discuss what the literature has to say about each of these factors.

3.1 The population's health status

While it is natural to say that individual sickness absence is driven by health – when we have a flu, we stay home from work – this is harder to claim for aggregate absence in a country. In fact, the swings in absence that we see in Figure 1 have either too low a frequency for epidemics like the flu, or too high a frequency for more long-term changes in health (of course, daily or weekly data on absence for individual countries show spikes during flu epidemics).

As for variations at business-cycle frequencies, it is well known that absence varies procyclically with the business cycle; when employment is high, absence is also high (Se Pichler, 2015, and the references cited therein). [7] There are two main explanations for this feature. First, there is a *selection effect*; when employment is high, even individuals who are not so healthy can get jobs, and thus average absence increases in the labor force (in a recession, those individuals would have been unemployed, or outside the labor force). Second, there is a *discipline effect*; when employment is high, people feel more secure at their jobs and dare to stay home when they do not fell so well, while they might not dare to do so during recessions.[8] In an attempt to disentangle these two effects, Hägglund and Johansson (2016, pp 46-48) found that the selection effect dominates in Swedish data.

Leaving the time-series properties of absence in individual countries, we now turn to the cross-country evidence. There have been may attempts to link absence to objectively observable measures of health. One of these measures is mortality. In Figure 5 we show the average absence (used in the previous figures) on the horizontal axis, and the mortality (i.e., the number of deaths per 1,000 inhabitants during a given year) on the vertical axis. We would expect that mortality and sickness absence are positively correlated.

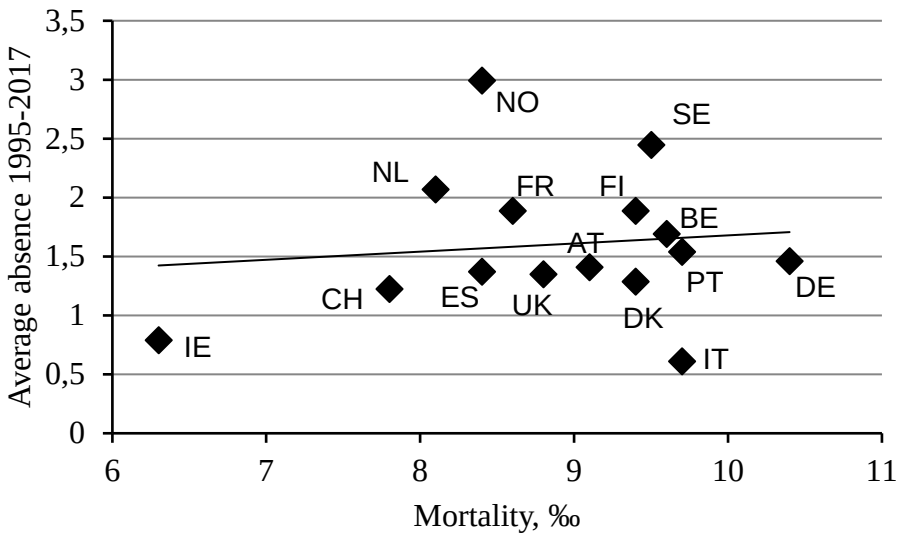


Figure 5: Average sickness absence 1995-2017 and mortality in 2011 for 15 European countries. Sources: Eurostat (LFS) and OECD (2011).

[7] Incidentally, while absence is positively correlated with employment in aggregate time series, it is negatively correlated in cross-section data for some countries. Thus, in municipalities where employment is high, absence is low – and in municipalities where employment is low, absence is high.

[8] Pichler (2015) shows that this discipline effect can cause persons with contagious diseases to go to work when they should in fact stay home, thereby infecting their workmates and thus causing higher overall sickness during booms.

We see that the relation between health and sickness absence is not very strong; the estimated line has a positive slope (as it should have) but it is not at all significant. Now, one can argue that mortality is not a very good measure of the population's health status. It depends on the age distribution since a relatively large proportion of very old people would lead to a high mortality rate even if the population is very healthy. This problem could be dealt with by age-specific mortality rates, but we will not go deeper into this issue.

Instead we look at another health measure, namely life expectancy. This is illustrated in Figure 6, which shows expected life time on the vertical axis.[9] If expected lifetime is a good measure of general health – which it is generally considered to be – we would expect a negative correlation.

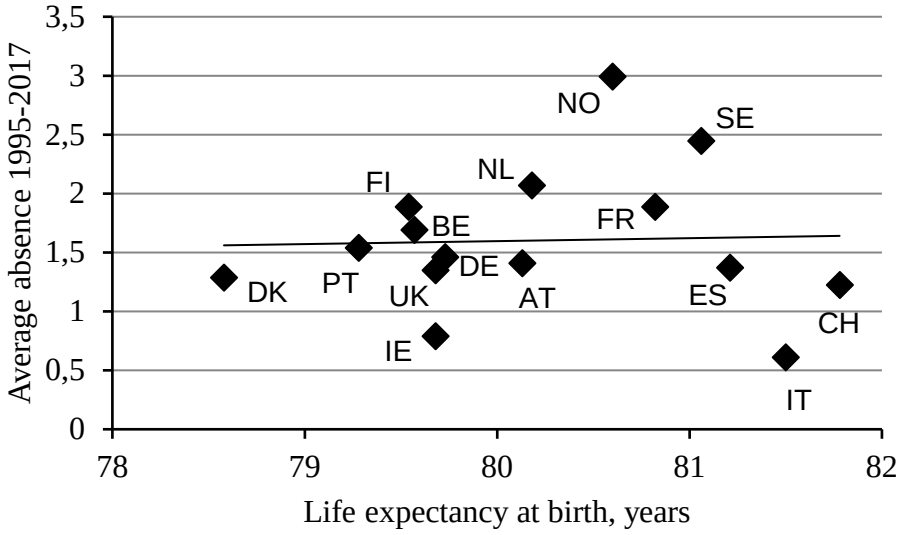


Figure 6: Average sickness absence 1995-2017, and life expectancy at birth in 2000-2005, for 15 European countries. Sources: Eurostat (LFS) and United Nations (2017).

We see from the figure that fitting a regression line would in fact yield a *positive* slope – contrary to all intuition – although it is of course not significant. Thus, there is no relation at all between the most common measures of health, namely mortality and life expectance on the one hand, and sickness absence on the other.

The same holds if we instead let health be represented by more subjective measures of health, such as the number of visits to hospitals, or the prescription of drugs.[10] A particularly interesting data source gives us information of self-reported health, namely the *World Values Survey*. A problem with the WVS is that the number of countries vary for each wave; in

[9] Life expectancy figures are taken from United Nations (2017) and refer to the period 2000-2005. These figures are arguably representative for the whole time period 1995-2017 (life expectancy remains fairly stable over time).

[10] See Hägglund and Johansson (2016, pp 37-40) for Swedish time-series evidence on these measures.

Figure 7 we show two measures of self-reported health from the 2005-2009 wave, in which 10 of our 15 European countries appear (in the other waves, fewer countries are studied).[11]

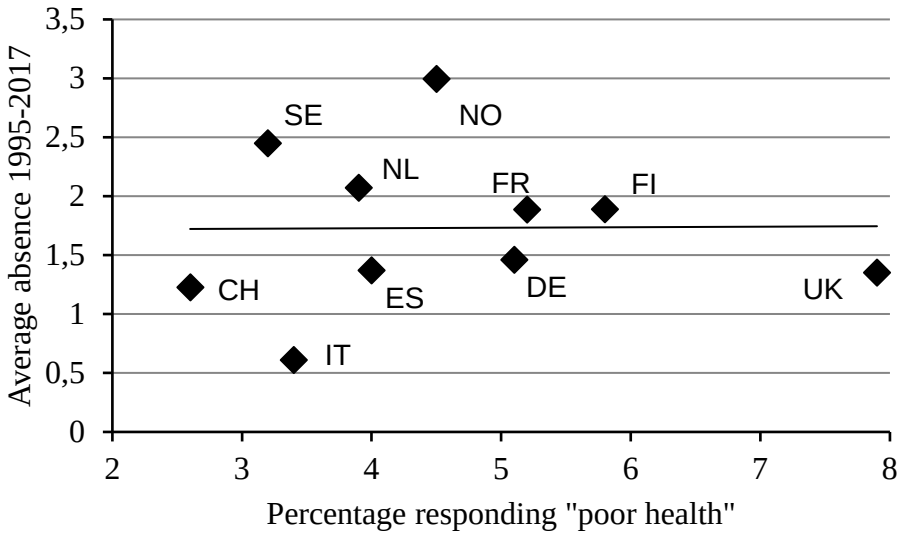


Figure 7: Average sickness absence 1995-2017, and self-reported health (the fraction of the subjects answering that their health is “poor” in the 2005-2009 wave of the *World Values Survey*). Sources: Eurostat (LFS) and WVS.

We see that there is a weak positive correlation between the absence rate and the fraction of individuals reporting that their health is “poor”, but the slope of the regression line is not at all significant. A slightly different pattern appears if we, instead of plotting the fraction reporting that their health is “poor”, plot the fraction reporting that their health is either “poor” or “fair” – but then the regression line has a negative, although insignificant, slope (not shown here).

The fact that there seems to be no relation between sickness absence and different measures of health – objective as well as subjective – poses something of an enigma. Since there is obviously a very strong relation between health and absence at the individual level (if we get a flu, we stay home from work) – how come there is no such relation at the aggregate level? One explanation might have to do with causality. In the aggregate population, bad health may cause high absence. It might however also be possible that if people are cautious, staying home from work as soon as they feel the faintest symptom of some ailment, that very behavior might cause a better health status in the population. And the interaction of these two directions of causation might lead to the very fuzzy relation between health and absence that we see in Figures 5, 6 and 7.

[11] The question reads: “All in all, how would you describe your state of health these days? Would you say it is Very good, Good, Fair, or Poor.” There is also a “Don’t know” alternative, chosen by 0.2 percent of the subjects.

Another explanation might be that there are other variables affecting sickness absence. In the next few sections we will study a few such variables.

3.2 The composition of the labor force

The data on absence shown in the diagrams above refer to the entire labor market. It is well known that women in general have higher sickness absence than men. Also, absence is higher among older than among younger groups in the labor force, and among employees in the public sector. The reasons for these differences are interesting in their own right, but will not be discussed here. We limit ourselves to showing a few stylized facts, illustrating the compositional effects.

Figure 8 shows, for each country, the average absence for men and for women, respectively. The countries are ordered according to total absence, i.e., in the same fashion as in Figure 2 (the numbers in Figure 2 are weighted averages of the gender-specific numbers in Figure 8). We first note that the ordering of the countries is basically unaffected by decomposing absence according to gender; Norway, Sweden and the Netherlands have higher absence not only overall, but also among women as well as among men. And Italy and Ireland have lower absence rates, regardless of whether we look at the overall figures or at the gender-specific figures. Thus the gender composition does not explain much – although some – of the ordering among the countries.

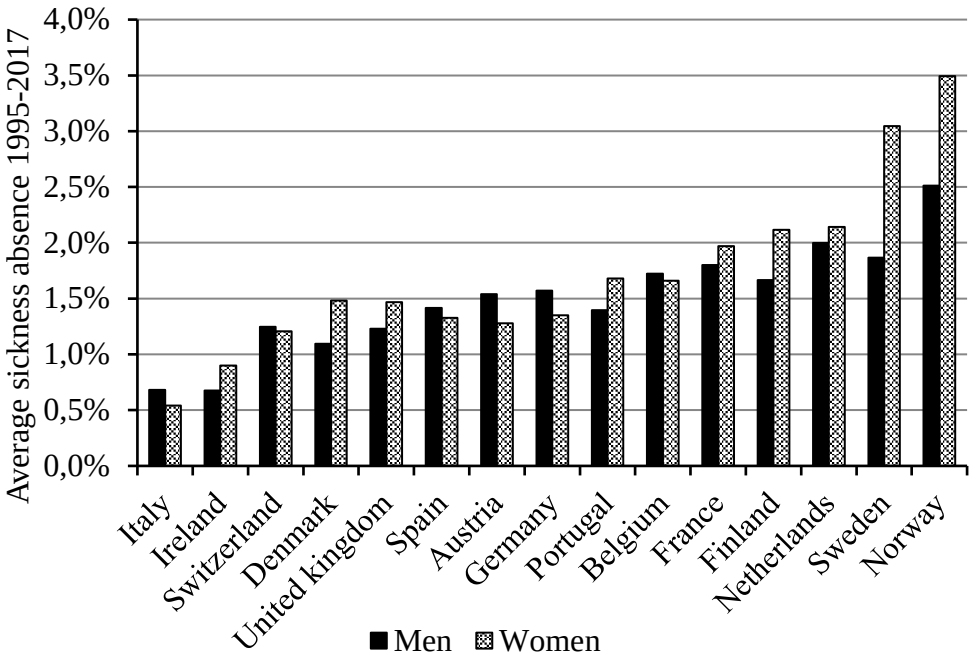


Figure 8: Average sickness absence 1995-2017 decomposed by gender.
Source: Eurostat, LFS.

Second, we see that there are a few countries where women actually display less absence than men: Italy, Switzerland, Spain, Austria, Germany and Belgium. These are countries that traditionally have had relatively low labor-force participation among women; thus the low female absence in those countries could be due to a selection effect.[12]

Similarly, the age structure of the labor force (older employees have higher absence than younger employees), as well as the industry composition of the economy (public-sector employees have higher absence than private-sector employees) have some explanatory power for the ranking of countries in Figure 2. To see whether the ranking of countries according to sickness absence is robust when we control for age, we show in Figure 9 the average absence for a more narrow age group, namely 25-54. This group is often referred to as the "prime-age" labor force, which should mean that there are no selection effects present in the data. We show these figures when displaying the 15 countries in the same order as in Figure 2.

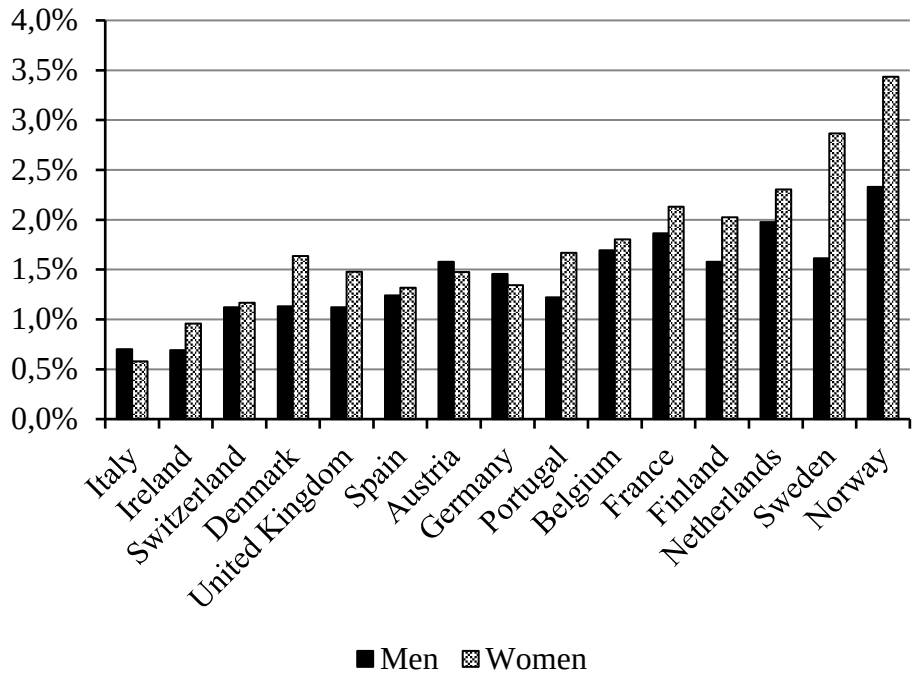


Figure 9: Average sickness absence 1995-2017 for the age group 25-54, decomposed by gender. Source: Eurostat, LFS.

We see that the ranking of the countries is basically unchanged – at least at the extreme ends of the distribution. An interesting feature is that although one would expect the prime-age labor force to display lower absence than the total labor force, the data shows the opposite, for both men and women, in some cases (Italy, Ireland, Denmark, Austria and France). This pattern indicates that some selection is going on and might warrant further research. The

[12] Interestingly, all these countries except Switzerland had a female labor-force participation rate *below* the EU average in 1990, and all these countries except Italy had a participation rate *above* the EU average in 2017 (Source: World Bank, https://data.worldbank.org/indicator/sl.tlf.cact.fe.zs). Thus the changes over time in gender-specific absence rates seem like an interesting topic for further research.

general conclusion is, however, that although the gender composition and the age composition matters for aggregate absence, controlling for these factors does not to any large degree change the positions of the low-absence and the high-absence countries.[13]

3.3 Institutions

By institutions we mainly mean replacement rates in the sickpay insurance system, the duration of benefits, and possible waiting periods before before the insured worker is eligible for benefits. In addition, the strictness of control, and the incentives for different players to re-integrate the employee after a spell of sickness may affect the absence rate, although such features are always hard to measure.

3.3.1 The replacement rate

We start with the replacement rate. There are several theoretical studies of insurance, showing that in general, the replacement rate should be lower than 100 percent. The first modern treatment of the economics of insurance is in Arrow (1963). For a modern discussion of Arrow's result, see Drèze and Schokkaert (2013). Although Arrow hypothesized that full insurance is not optimal, he did not clearly show whether this result was driven by unobservability or by the insurer's need to cover overhead costs. This issue was resolved in the context of sickpay insurance by Diamond and Mirrlees (1978): the fact that less-than-full insurance is optimal is a consequence of the moral-hazard problems associated with unobservability of an individual's health status. If health were fully observable to outsiders, 100% insurance would be optimal.[14]

As for empirical studies, we begin by some cross-country data. The SCIP and SPIN data sets provide information on a number of insurance systems in OECD countries. Acknowledging that replacements can be very complex, depending on the income of the insured, the length of a sick spell, the industry in which the insured is working, and a number of other factors, the SCIP/SPIN database summarizes these features in one number: the net replacement rate for an average-length spell of sickness, expressed as a percentage of the net (after-tax) wage of an average industrial worker. This number is reported in Figure 10, for 13 of our 15 European countries, for the years 2000, 2005 and 2010.[15]

[13] One might want to pursue this issue further, by controlling for gender, age and industry. This is however hard to do, since the number of observations in each cell (say, women aged 55-65 in the manufacturing industry) of the Eurostat data then becomes rather small, making the results correspondingly unreliable.
[14] For a more general discussion of this result in sickpay insurance, see Lindbeck and Persson (2013), and Lindbeck and Persson (2018).
[15] Spain and Portugal are missing in the database. Data for 2015 will be available towards the end of 2018.

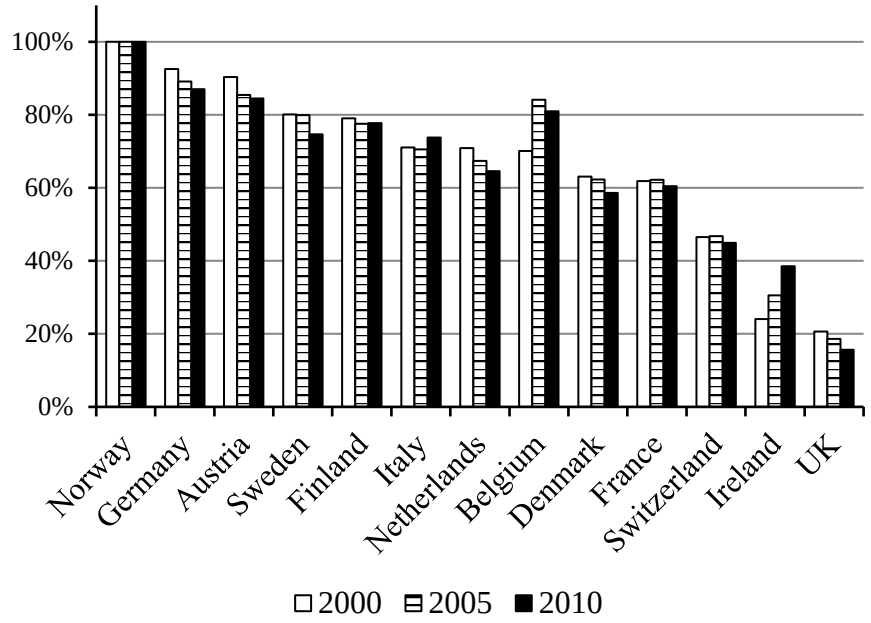


Figure 10: Replacement rates for 13 European countries, 2000-2010.

Source: SCIP/SPIN

As with all cross-country data, there is a caveat to the extent that the SCIP/SPIN database does not include all sickpay compensations for some countries with decentralized insurance arrangements. This is the reason why, for instance, Ireland and the United Kingdom seem to have such low compensation levels; in these countries, there is a flat rate benefit (which is the one showing up in the SCIP/SPIN data) topped with individual insurance schemes.[16] Thus the levels of Figure 10 do not give an accurate picture of the incentives facing the individual when contemplating whether to stay home or not – but for most countries, it gives at least a roughly correct picture.

We see that replacement rates have been fairly stable over the period; the ranking of countries with the in 2000 is – with three exceptions – the same as the ranking in 2010. In most countries the rates fell during the period – with the exception of Norway (where the rate remained constant at 100%), Italy, Belgium and Ireland (where the rate increased). There are many reasons why a replacement rate may change over time: discretionary changes in the rules, nominal wage growth (with constant rules in nominal terms), and real-wage growth (with constant rules in real terms). Sometimes it is difficult to even conceptually distinguish one of these reasons from another. For instance, keeping the rules constant in the face of inflation (or real-wage growth), thereby achieving a reduction in the rate that might not have been politically feasible otherwise, is in some sense a discretionary decision.

[16] See European Commission (2016).

Although there are obvious measurement problems in the SCIP/SPIN replacement level data, we have nevertheless chosen to plot them against the usual average absence numbers from Figure 2.[17] The plot is shown in Figure 11, and we see that regression line has a positive slope; in fact, it is statistically significant ($p = 0.051$). These results should of course be interpreted cautiously. In addition to the measurement problems there may be omitted variables that affect both absence and replacement rates. For instance, a particular type of country – say, a rich country – might desire (and afford) both a high absence rate (because leisure is a normal good) and a high benefit level. Unfortunately, the number of observations is too small to allow for a serious statistical analysis along these lines.

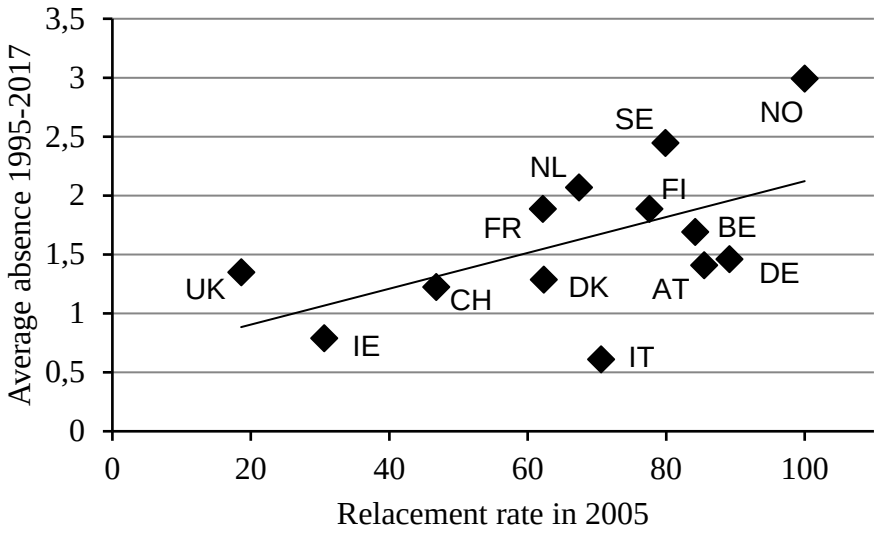


Figure 11: Average sickness absence 1995-2017 and the replacement rate in 2005 for 13 European countries. Source: Eurostat (LFS) and SCIP/SPIN

But even if the empirical evidence is unclear in cross-country data, the country-specific time-series evidence clearly shows that the replacement rate does matter for sickness absence. In a pioneering paper, Fenn (1981) used British data to show that the probability that a person on sick leave will return to work in the next time period is a significantly decreasing function of the replacement rate. Since then, the effect of the replacement rate has been extensively studied.[18]

Henrekson and Persson (2004) analyzed Swedish aggregate time-series data and showed that when the replacement was raised (lowered), sickness absence increased (fell) – although with a time lag.

[17] The replacement levels in Figure 11 refer to 2005, which is reasonably in the middle of the period 1995-2017.
[18] A survey of earlier work, mostly for the US, is found in Krueger and Meyer (2002).

Johansson and Palme (1995) used a labor supply model for the day-to-day choice on whether or not to be absent from one's regular work. Using individual data from the 1981 Swedish Level of Living survey, they found that economic incentives, and therefore the construction of the sickpay insurance program, has a significant effect on work absence behavior.

An obvious limitation of Johansson and Palme (1995) is that their identification of differences in cost of being absent comes indirectly from differences in hourly wage rates, which may be correlated with unobserved individual characteristics, such as preferences for work and health differences that could not be observed in the data, but could be correlated with work absence behavior. To deal with this problem, Johansson and Palme (2002) use panel data and a reform of the Swedish sickpay insurance implemented in March 1991. The reform implied that the replacement rate was reduced from 90 to 65 percent during the first three days in a sickness spell, to 80 percent from day four to 89 and remained at 90 percent for spells longer than 90 days. The authorsuse the pre-reform work absence behavior as "controls" for individual propensity to be absent from work and find a significant effect of the reform on work absence behavior in several different demographic groups.

Johansson and Palme (2005) further explored the 1991 reform. This paper uses the discontinuous change in the replacement level at March 1 and compare it with the behavior in the period surrounding the reform with the corresponding behavior the year before, when the reform did not happen. Overall, they found that the increased cost for the individual of beginning a spell dominated and that the number of replaced days from the sickpay insurance decreased because of the reform. The estimated elasticity of the number of work-absence spells with respect to the cost of being absent was estimated to -0.93 for males and -0.72 for females. The estimates of the elasticities for the duration of the spells were in general smaller and not statistically significant in all groups.

A useful summary measure on the effect of how economic incentives affect work absence is the expected change in absence if we change the replacement rate by one percentage point – i.e. the elasticity of absence with respect to the replacement rate. There are several such estimates, usually ranging between 0.5 and 1, which means that a one-percent increase in the sickness benefit leads to an increase in sickness absence by between 0.5 and 1 percent. For instance, Pettersson and Skogman Thoursie (2013) report an estimate around 1 for Sweden while Johansson and Palme (2005) obtained an estimate of 0.5. Zieberth & Karlsson (2014) report an elasticity of 0.5 for Germany, while Pichler and Ziebarth (2014) found that sickness absence responded by around one percent for each percent's change in the benefit rate. Bockerman, Kanninen and Suoniemi (2018) report an estimate of around 1 for Finland, i.e., a 1 percent increase in the benefit will make the length of the sickness spells increase by 1 percent. The question is how reliable such estimates are. Although their order of magnitude is probably accepted by most researchers in the field, their exact magnitude of course depends on other features of the insurance system, and it is likely to vary across time as well as across countries.

Finally one should note that an insurance contract imposes a tax wedge on the individual's labor-supply decision. This means that even if the elasticity were very small, and in the

extreme case zero, there is a distortion of the labor supply – distortion that is unavoidable if one wants insurance, but nevertheless causes problems in the labor market. Lindbeck and Persson (2013) show that this tax wedge is equal to the sum of the replacement rate and the contribution rate This sum – given the replacement rates shown in Figure 10 above and the contribution rates necessary to finance them – should be added to the other tax rates that affect labor supply (the income tax and the value added tax) and the result is, for many countries, a tax wedge that exceeds 100 percent.

3.3.2 Other institutions

There are numerous other institutions in the form of rules regulating the insured individual's rights and obligations. One that is easy to measure is the *waiting time*, i.e., the time that has to pass, after an individual calls in sick, before he or she receives benefits. The SCIP/SPIN database provides information about waiting times for most of our 15 countries (Figure 12).[19]

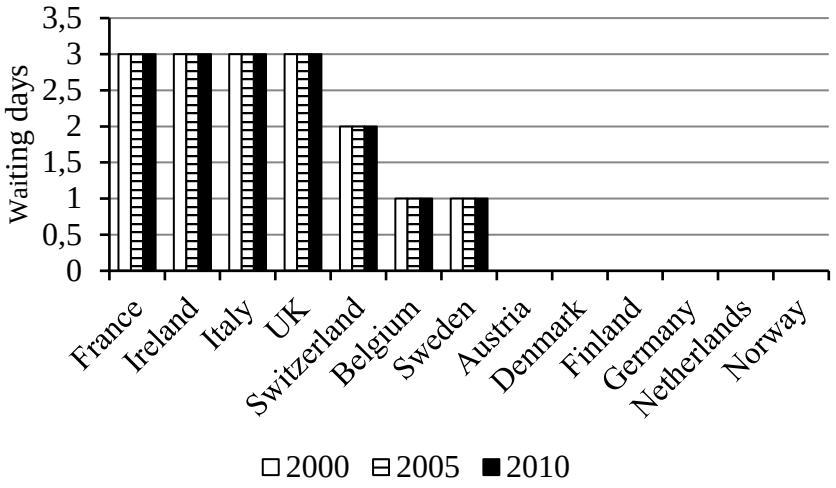


Figure 12: Waiting days for 13 European countries. Source: SCIP/SPIN

Can we expect the number of waiting days to be correlated with the average sickness percentages of Figure 2? There are theoretical reasons why we should expect a positive correlation: a waiting period might make the individual to stay home for longer periods. For instance, a waiting period may make the individual go to work when feeling just a bit bad – for instance, at the outset of a more serious sickness – thereby risking more long-run health problems. Also, there is a psychological mechanism: if the waiting time is one day, and an individual falls sick for only one day, he or she might feel entitled to a second day of absence, just to get some paid absence. Furthermore, the absence data of Figure 2 only refers to spells of a week or longer; it is hard to tell how such spells are affected by waiting days (that by definition only refer to short spells) but one may conceive of a positive as well as a negative

[19] The European Commission (2016) database gives different (longer) waiting times for some of the countries; these data might refer to the basic, government-mandated systems that are complemented by labor-market negotiated systems with shorter waiting times.

correlation. Finally, and maybe most important: the number of waiting days can be seen as an indication of the general strictness of the insurance scheme. There are many factors that are unobservable (like the diligence in monitoring by doctors or by employers) that might affect absence, and these factors may be correlated with the number of waiting days.

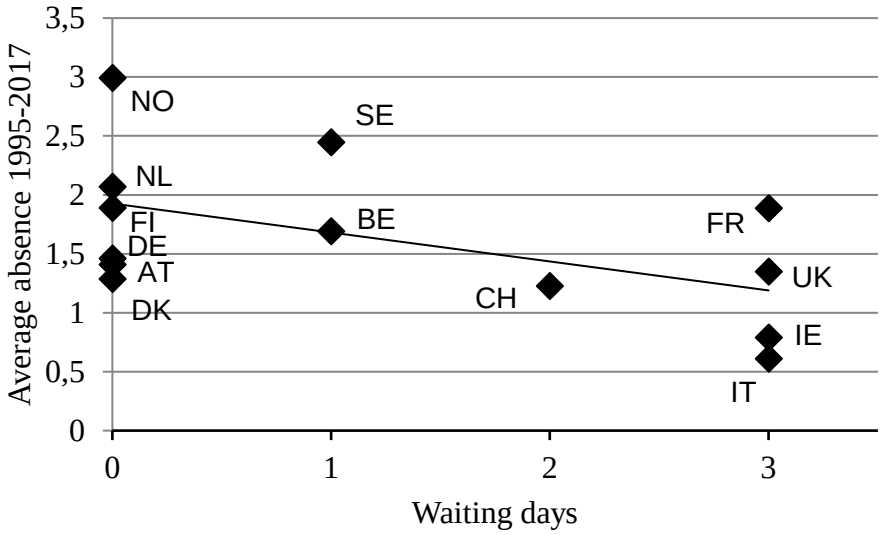


Figure 13: Average sickness absence 1995-2017 and the number of waiting days in 2005 for 13 European countries. Source: Eurostat (LFS) and SCIP/SPIN.

All in all, the relation between the absence and waiting periods is an empirical question. In Figure 13 we have plotted the average absence rates of Figure 2 against the waiting periods of Figure 12. We see that there is actually a negative relation – and it is weakly significant (p = 0.070). Although there are many ways in which such a negative relation can be interpreted, our interpretation is that the number of waiting days can be regarded as an indication of the general strictness of the insurance system.

There are good arguments both for and against waiting times. Having a waiting period during which the individual receives nothing is just an example of less-than-full insurance, which is optimal according to the theoretical literature (cf. footnote 14 above). It curbs moral hazard (leading to fewer short spell of absence) which is good. However, the theoretical literature only says that the individual should not be fully insured, but it does not say much the best form for this deviation from full insurance: should it be in the form of zero benefits during the first 3 days and 100% thereafter, or should it be 75% throughout the whole spell of absence?

A waiting period obviously leads to fewer short spells of absence, as has been documented in a few empirical studies. For instance, Pettersson-Lidbom and Thoursie (2013) analyzed a Swedish reform, where the one-day waiting period was abolished. Unfortunately, it was not a ”clean” reform; the benefit rate was raised at the same time. When trying to disentangle the

two effects, they found that the abolishment of the waiting day lead more, but shorter, spells of sickness – and the overall result was less absence.

A cleaner reform has been studied by Cazenave-Lacroutz and Godzinski (2018), namely the introduction in France of a one-day waiting period in January 2012, which was abolished by a new government after two years. The reform affected only central-government employees, which made it suitable for a difference-in-differences approach. The authors found that the reform, the purpose of which had been to reduce absenteeism, failed; the number of short spells fell, but the number of long-term spells increased – and the net result was not significantly different from zero.

The studies by Pettersson-Lidbom and Thoursie (2013) and Cazenave-Lacroutz and Godzinski (2018) illustrate a possible argument against a waiting period. If staying home is costly to the individual, he or she might go to work even if staying home a day or two would have been a better option for the long-term health outcome. And in the case of contagious diseases, going to work at the early stage of, e.g., a flu might result in a higher absence among workmates. This so-called "contagious presenteeism" has been studied empirically; for instance, Pichler and Ziebarth (2017) found that a lowering of the German benefit rate in 1996 led to more contagion of flu among workmates, and a raise of the benefit rate in 1999 led to less. These results referred to the benefit level, but there is (to the best of our knowledge) no similar study in the context of waiting days.

Finally, it should be noted that the question of a waiting period addresses a more general question, namely that of the optimal time profile of benefits during a spell of sickness. A waiting period with zero benefits, and a non-zero benefit rate thereafter, is just an extreme example of benefits increasing over time. One might also argue that benefits should be a *decreasing* function of the length of the spell. All these variants have been tried in different countries, but the conclusions one can draw from these experiments are mixed.[20] The question – i.e., the optimal time profile of benefits – has also been discussed in the literature on unemployment insurance; there, a common conclusion has been that the benefit rate should decline over time, but this view is not universally agreed upon among the scholars.[21]

Another institution that varies across countries is *duration*, i.e., the maximum time span during which one can receive sickness benefits. In principle, this is – like the waiting period – just an example of the issue of the optimal time profile in insurance; when the duration expires, benefits are zero. For most European countries it is one year; but it varies from three years to half a year.[22] Such numbers do not, however, tell us very much about the economic incentives in reality to stay home from work, since countries can offer very different conditions for a sick person after the maximum duration has expired. We have therefore not made any graphs, or run any regressions of absence against duration. In the context of unemployment insurance, there is also an issue of duration.

[20] See Henrekson *et al*. (1992, pp 26-27) for a review of the time profiles of sickness benefits in different countries around 1990.
[21] See Karni (1999) for a survey of the earlier literature, and Kolsrud *et al*. (2018) for a discussion of the later.
[22] See European Commission (2016).

Markussen *et al*. (2011) use data on all certified sickness absence spells in Norway in the period June 2001 to December 2005. They estimate non-parametric duration models and find a significant and dramatic increase in recovery rates when the generous sickness benefit expires after one year of absence duration. There are numerous empirical studies of the effect of the unemployment insurance expiration dates on job finding rates. Most such studies find that the probability of an unemployed individual finding a job increases significantly as the expiration date approaches.[23]

Another institution, which is even harder to measure, is the *strictness of control*. In all countries, a doctor's certificate is required (except for short spells) for an individual to receive benefits. For very short spells (say, a day or two) control is impracticable, and the insurer has to rely on the individual's own health assessment. For longer spells, the strictness of the doctor as well as of the administrator becomes crucial for the functioning of the insurance. Everybody would agree that monitoring affects absence behavior, but monitoring is difficult to measure, except in a few cases. In a 1988 experiment in Sweden, the period during which no doctor's certificate was required was increased from one week to two in one large municipality. As a result, the average duration of the spells increased in that municipality by 6.6 percent.[24] As mentioned in Section 2 above, the Dutch and the Swedish reforms in the 1990s included a tightening of routines for both doctors and administrators (for instance, a doctor was required to state explicitly not only that a benefit claimant is sick, but also that this particular sickness prevents him/her from working).

A concept borrowed from statistical theory is particularly relevant to the discussion of insurance, namely *Type I* versus *Type II errors*. A Type I error occurs when a person who is not entitled to sick pay nevertheless obtains it (for instance, by simulating sickness) while a Type II error occurs when a person who is really entitled to sick pay is rejected by the insurer (for instance, if the doctor or the administrator thinks that the claimant looks quite healthy after all). There is always a trade-off between these two types of error: a more strict control reduces the probability of Type I errors but increases the probability of Type II errors, and a more lax control has the opposite effect. A good monitoring institution achieves as favorable a trade-off as possible, i.e., minimized the probability of Type I errors for a given probability of Type II errors and vice versa.

There are two basic features of health that make the Type I/Type II error problem particularly difficult: health is normally a continuous variable, and is furthermore unobservable to outsiders (in many cases, even to doctors).[25] In a few cases, health is however dichotomous and observable; for instance, breaking a leg is dichotomous (either you break your leg, or you don't) and fully observable. In those cases full insurance is optimal. We may therefore conceive of a variable replacement rate, conditional on the observability of the ailment: a

[23] See Card *et al*. (2007) for a review of this issue.
[24] Hesselius *et al*. (2005).
[25] Cf. Lindbeck and Persson (2013) for an analysis of the role played in insurance by continuity and unobservability.

broken leg gives 100% income replacement (provided the leg is necessary for your work) while a more vague back pain only gives, say, 40%.

However, such sophisticated insurance schemes do not exist in the real world. And when health is continuous and unobservable, there is an incentive for both individual administrators and individual doctors to accept more Type I errors – since then nobody would complain, and the budget problems of the insurance system are abstract problems that might occur only far into the future. Making a Type II error, on the other hand, would have an immediate impact on the doctor or the administrator in charge; there would be complaints, and perhaps attention in the mass media. Therefore, as a general rule, one would expect Type I errors to be more common in the real world than Type II errors, but we are not aware of any study that documents such a pattern in the data.

One form of control was implemented in Norway in 2007 and consists of compulsory meetings between the long-term absent worker, his or her physician a representative for the employer. This program is evaluated in Markussen *et al*. (2017). Since the local social security administration were able to make exemptions from the compulsory meetings, Markussen *et al.* were able to exploit geographical differences in both overall use and timing of these meetings to analyze the policy change as a randomized experiment. The fact that all announced meetings did not take place allowed the authors to distinguish between the "notification effect" – from the threat of being contacted by the social security administration – and the "attendance effect" – from attending the actual meetings – on the duration of the absence spells. The results of the study show that the duration of absence spells fell on average by about 20 calendar days. The "notification" and "attendance" effects contributed equally to the overall effect.

There is, however, some evidence indicating that interaction between administrators and sick-pay claimants might have adverse effects. Engström, Hägglund and Johansson (2017) uses data from a field experiment where one group of individuals were assigned to treatment in the form of a meeting with a caseworker from the Social Insurance Agency early on in their sickness spell. Unexpectedly, the results show that the experimental group had a lower outflow from the sickness insurance and a higher inflow to the Disability insurance program after b15 months in their sickness spell. To explain this result, the authors develop a theoretical model with heterogeneous workers. When needs for rehabilitation programs are screened those with low work incentives have incentives to signal worse health, which will decrease the outflow from the sickness insurance and, subsequently, increase the risk to exit from the labor market through the Disability insurance.

Finally, there is an institutional arrangement that tries to address the problem of observability as well as the problem of incentives for monitoring the insured individual. We refer to systems where the benefits are paid not by a government-run insurance system, but by the employer. The latter is likely to have better information about the employed individual than the government, and will have a stake in the individual being properly integrated back to work after a sick spell. Many countries have at least to some extent abandoned government-run systems to employer-run systems when costs of absenteeism ran high in the 1980s and 1990s.

In Sweden, the employer pays benefits during the first two weeks of a sick spell, and in Norway the first 16 days in a spell. The Netherlands has in a series of reforms extended the period mandated for the employers. In the United Kingdom and Ireland, the government-mandated system is very small (cf. Figure 10 above) with the largest part of sickpay insurance being quite decentralized.

Acting as insurer in this fashion means shifting the risk to the employer. This may create a disproportionally high risk for small firms, and therefore employer should be able to insure against this risk.[26] In order for incentives for monitoring and re-integration to remain with the employer, who is the most suitable player for that role, so-called experience-rated insurance fees have emerged. This means that employers with a bad track record of sickness absence face higher fees than employers with a good track record. Such a system seems to solve a large number of problems in sickpay insurance, but one basic problem remains: employers might be less inclined to hire individuals with potential health problems in the first place.

Fevang *et al*. (2014) analyse the effects of a reform of the Norwegian sickpay insurance whereby the liability of short-term pregnancy-related sickness absence was removed from the employers to the public sickpay insurance system. The motive for the reform was to eliminate the disincentive effect of employers' higher expected costs for hiring young women. In addition to that, the reform also removed the disincentive effect of potentially higher costs for the employers of workers returning from an absence spells from the risk of beginning a new short spell financed by the employer – "the sick pay trap". The results show that the employers reacted on the change in both sets of incentives. The absence rate among pregnant women decreased and the expected duration before finding a job after completed education decreased for females.

4. Social norms and attitudes to work absence

In recent years, researchers have turned their attention to the role of social norms – i.e., to the notion that individual behavior is not affected by traditional economic incentives, but also by the behavior of others (like friends, neighbors and other peer groups). In this relatively new field of economics, several social problems have been analyzed – in such diverse fields as as welfare dependency,[27] the use of publicly funded maternity care,[28] crime among adolescents,[29] and portfolio choice.[30]

[26] According to OECD (2010, Table 5.1), most European countries have systems where the employer pays for the first part of a sickness spell, but in only one country (the United Kingdom) the employer can re-insure with a private insurer.
[27] Bertrand *et al*. (2000) and Åslund and Pettersson (2009).
[28] Aizer and Currie (2004).
[29] Balvig and Holmberg (2011).
[30] Duflo and Saez (2002, 2003).

There have been some studies of attitudes towards sickness absence. In an empirical study of people's attitudes, Hauge and Ulvestad (2017) found that employees with more lenient attitudes to work absence have higher sickness absence rates for short spells (not requiring a doctor's certificate) but not for longer spells (that require a doctor's certificate). And many medical doctors seem to have lenient attitudes to issuing certificates; in a survey, Englund (2008) found that even if doctor in charge thought that there was no reason to grant sick leave, the doctor nevertheless issued a certificate in more than 20 percent of the cases.

Social norms are important since they can enforce the effects of "traditional", economic incentives. If staying home from work and living on benefits is socially stigmatizing, which in itself curbs moral hazard, a reform that increases absence will – since more people stay home – reduce the stigma of doing so. Thus a social norm, the strength of which is a decreasing function of the number of people who violate the norm, can enforce policy-induced swings in the absence rate. Assume, for instance, that the benefit rate is increased by one percent. According to the elasticity estimates reported in Section 3.3.1 above, sickness absence would then increase by between 0.5 and 1 percent. But as more people call in sick, their friends and neighbors might be affected, lowering their own thresholds for calling in sick. Thus, the number of absentees would increase, and as a consequence of that increase in absenteeism, even more people would choose to stay home. The concept of a "social multiplier", meaning that in the long run, total absence might increase by a factor of maybe two or three times the original increase, was coined by Glaeser *et al*. (2003).

The theory of social norms in sickness insurance addresses questions concerning how the social multiplier is affected by the insyurer's budget constraint, whether norms can give rise to multiple equilibria (i.e., one equilibrium with a high absence rate and one with a low, for the same replacement rate), whether norms are good or bad for social welfare, whether individuals should be allowed to opt out from a public insurance scheme, and the like. These theoretical issues, which are addressed in Lindbeck and Persson (2018), raise a host of empirical questions that have not yet been subject to empirical analysis.

Do social norms effects – i.e., one individual being influenced by another individual's absence behavior – exist in real-world sickpay insurance? Hesselius *et al*. (2009) report results from an experiment in Sweden, where monitoring was relaxed for half of the inhabitants in the municipality of Göteborg: instead of being required to provide a doctor's certificate for spells of absence being longer than one week, the treatment group were required to provide a certificate for spells longer than two weeks. This resulted in increased absence not only among the individuals in the treatment group, but also among their co-workers.

In another study, Hesselius *et al*. (2013) extended the analysis in two ways. First, they studied absence in a control group consisting of non-treated individuals living in Göteborg, and in other municipalities. It turned out that the "spillover effect" (i.e., the fact that non-treated individuals increased their absence) was strongest in Göteborg, and weaker in municipalities located further away. Second, they studied immigrants in the treatment group and found that

as an immigrant increased sickness absence, non-treated individuals with the same country of origin increased their absence more than did immigrants from other countries.

These two studies make use of quasi-experimental data, which means that the identification is convincing. One can thus feel rather sure of the *qualitative* results: less monitoring does affect the behavior of non-treated individuals in various peer groups. It is however difficult to know whether the *quantitative* results can be extended to other reforms. And since good experiments are scarce, one has to rely on non-experimental data.

In such a study, Lindbeck *et al*. (2013) studied "local benefit cultures", namely how a high absence rate in one neighborhood may induce individuals living in that neighborhood to increase their own absence. Using a set of fixed effects and instrumental variables to identify the causal effect, they found that there is a social multiplier with the size of 1.23. This means that a policy-induced change in absence by 1 percent is boosted by another 0.23 percent.

These magnitudes of the social multiplier are very similar to the estimates obtained by Markussen and Røed (2015). Using a data set including the entire Norwegian population and an econometric model with fixed individual effects they found that an exogenous change in sickness absence of the group who went to the same junior high school led to an additional 25 percent effect in absence rates. The effect was stronger if the peer group was restricted to the same level and the same gender. The corresponding estimates for neighborhoods was 17 percent and again a stronger effect was estimated for a closer peer group.

Another form of social interaction effect – presenteeism – is studied in Markussen *et al*. (2012). They evaluate a reform where the insured workers got compensation from the sickpay insurance corresponding to their productivity loss, rather than being compensated for loss of full time earnings as a default alternative. The reform also implied that they were required to, at least partially, be present at their work place. For obvious reasons, the program did not apply to infectious diseases. The result showed strong effects, not only on return to work, but also on subsequent employment.

5. Outright cheating

Finally, we should mention the possibility of *outright cheating* – which could be the result of social norms, or lax monitoring on part of doctors and administrators, or some other underlying factor.

It is very difficult to prove that cheating is taking place. This is so because of the very nature of health. If health were a dichotomous and observable variable, finding out who cheats would be an easy thing; either a benefit claimant has broken a leg or not. But since health is normally continuous and unobservable, exposing and prosecuting cheaters is almost

impossible. Anecdotal evidence is abundant, but cases prosecuted are very few. In two or three Swedish cases, the sickpay administration had suspected cheating when persons receiving sickpay benefits for back pain (which is manifestly unverifiable for outsiders) were observed doing heavy forestry work, or carrying big bags outside a shopping mall. Although the actions of these persons were documented by video cameras, the resulting court case resulted in acquittals, as the suspects explained that they had normally very difficult (although unverifiable) back pains – but that very day, when they were filmed, the pains had miracously disappeared for a brief time, which they used for doing some work in the forest, and some shopping.

Criminal court procedure can also be explained in terms of Type I and Type II errors; here a Type I error occurs when a guilty person is acquitted, and a Type II error when an innocent person is punished. The courts attach much higher weight to avoiding Type II errors than Type I errors, and thus cases where it is difficult to verify what has actually happened almost always result in acquittals.

There is, however, one example from sickpay insurance that is often regarded as a case of cheating. A few decades ago, two important (for Sweden) sports events took place: the 1987 Nordic Ski World Championship in Oberstdorf (West Germany) and the 1988 Winter Olympics in Calgary (Canada). In both cases, Sweden had made it to the men's finals, which were broadcast on Swedish television in real time. Skogman Thoursie (2004) showed that in both cases, one-day sickness absence, which did not require a doctor's certificate, increased significantly among men but not among women.

Unfortunately, not even this case can be seen as a watertight proof of cheating – and this is because of health being continuous and unobservable. It might be that the men who decided to stay home during the two sports events actually suffered from some hard-to-verify ailment, like back pain. They would thus be entitled to sickpay benefits, but in normal times they showed a stiff upper lip and went to work although they suffered from the pain – maybe out of loyalty to their employer. But on these two occasions, they decided to exercise their right to stay home; the combination of back pain and an important sports event on television turned out to be stronger than their unselfish loyalty to their employer.

The Skogman Thoursie (2004) study of sporting events is thus very instructive, because it points both to the very likely existence of outright cheating and to the problematic nature of health (being a continuous and unobservable state). Thereby it yields insights into the difficulties connected with running a sickpay insurance system.

6. Conclusions

What are the conclusions from the above review? The foremost one is that economic incentives matter. One may think that people stay home when they are sick and go to work when they are well, but reality is not that simple. The basic problem of sickpay insurance is

moral hazard, which derives from the fact that health to a large extent is continuous and non-observable.

There are several ways of dealing with this moral-hazard problem. The first is the replacement rate. According to theory, the replacement rate should be lower than 100 percent. And the empirical evidence is clear: sickness absence increases with the replacement rate. Countries with high benefits also tend to have high sickness absence, and when the benefits are changed in a country, absence also changes accordingly.

Whether this implies that there should be a number of waiting days before insurance benefits are paid is, however, an open question. There are arguments for and against waiting days, and we have no strong view on this issue. But it seems reasonable to impose a termination date after which the sickpay insurance ceases to pay benefits; like in the unemployment insurance, people adjust their behavior as the termination date approaches, and become more likely to return to work. Of course, the effect of such a termination date depends on what system kicks in thereafter for those who do not return to work.

Control and monitoring is important, but apart from such a general statement (and its natural implication that a doctor's certificate should be provided), economic research does not tell us much about how control should be exercised. There is, however, empirical evidence that meetings with doctors, nurses and/or administrators and - as shown by Markussen (2017), even notifications of such meetings - may reduce absence.

One way of containing moral hazard is to create incentives for the employers, who arguably have the best information about the health state of their employees, to take a more active part in monitoring and reintegration of absentees. Therefore, many countries have a dual system, where the employers are responsible for an initial period of sickpay while the government will take the responsibility thereafter. It is important that the employers can insure against this risk via a system of experience rating. We do not know, however, why private insurance markets do not offer such insurance to a larger extent; this seems like a question where further research is warranted.

Social norms and attitudes are important. They enforce the effects of traditional policy measures, such as replacement rates, waiting days, and monitoring. The problem is that norms and attitudes cannot be regarded as decision variables for the authorities; it is hard to think, for instance, that a government-sponsored propaganda campaign ("Don't cheat!") will have any effects other than ridicule. But there is one important policy conclusion to be drawn from the research on social norms: the immediate impact of any policy change will be smaller than the long-term impact, when norms adjust. Therefore policy makers might believe that a reform increasing the "generosity" of the system, like a benefit hikes, is not that costly, since sickness absence does not increase so much immediately after the reform. But the long-term effects can be larger, accentuated by a "social multiplier". This, of course, also holds if the system is made less "generous", by benefit cuts and strengthening of control: the long-term gains are larger than the short-term gains.

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