

# Benefit Morale and Cross-Country Diversity in Sick Pay Entitlements

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## Abstract

We analyze the impact of a country's level of benefit morale on the generosity of sick pay entitlements in a political economy framework. Stronger benefit morale is predicted to reduce the number of recipients. On one hand this reduces the probability of receiving benefits, on the other hand it makes insurance cheaper. Numerical simulations show that the probability effect reduces the positive price effect when moving to higher levels of benefit morale. We find some empirical evidence for this concave relationship between benefit morale and entitlement generosity in a sample of 34 developed countries between 1981 and 2010 that is characterized by a significant and robust positive pattern for low morale countries that flattens for medium to higher morale countries.

*Keywords:* sick pay insurance, political economy, work absence, social norms

*JEL:* H53, P16, Z13

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# 1 Introduction

There are large differences in the generosity of public sick pay entitlement programs across developed countries. These entitlements range from full replacement of the earned wage in some European countries to no entitlement at all in the USA. Compared to other welfare programs, sick pay programs display a particularly vast institutional diversity. This institutional diversity corresponds to considerable variation in average sickness absence days across OECD countries, ranging from four to 29 days per year and employee. As developed countries are quite similar, an explanation for this institutional diversity is far from self-evident. This paper seeks to fill this gap by contributing to the theoretical and empirical reasoning on causes of program diversity in sick pay insurance.

We argue that cross-country differences in social norms against benefit fraud can explain cross-country diversity in sick pay. We subsequently call this social norm against benefit fraud “benefit morale”. In some countries people are more tolerant towards people committing benefit fraud compared to countries where the population adheres to a stricter benefit morale. These differences can be substantial, even within Europe. Survey data suggest that in Denmark almost 90 percent of the respondents think that it is “never justifiable” to claim government benefits to which one is not entitled, while only a quarter of the respondents in Greece are of this opinion. There is theoretical (Lindbeck and Persson, 2010) and empirical evidence (Ichino and Maggi, 2000) that social norms influence absence behavior. Hence we suppose that a stronger benefit morale in an economy reduces, *ceteris paribus*, the number of people calling in sick. While the effect of benefit morale on the absence rate is clear-cut, its effect on the equilibrium replacement rate is ambiguous. On one hand, a reduced absence rate makes the insurance cheaper with the usual demand side effect. On the other hand, this implies that it is less likely for an insured person to be absent, which makes the insurance less desirable.

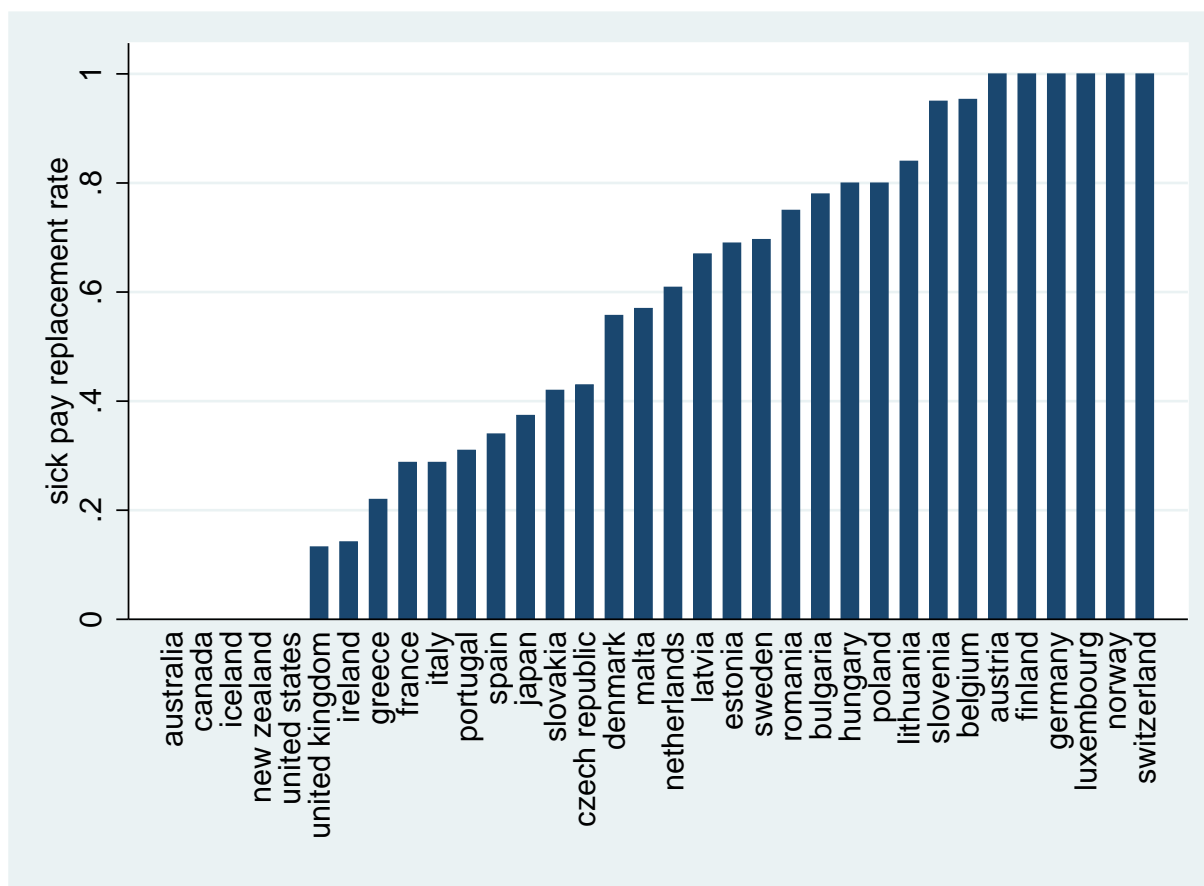


Figure 1: Average sick pay generosity in the years 1985-2010 in 34 countries, measured as the gross replacement rate in the first week of illness for a single worker earning an average production wage. Source: based on own calculations (further information in the data appendix).

According to Elster (1989), Lindbeck (1995) and Postlewaite (2010), norm guided behavior can be opposed to outcome oriented behavior emanating from instrumental rationality (“rational choice”). Norms are called “social” if there exists a socially shared expectation that everyone behaves according to the norm (Elster, 1989; Lindbeck, 1995). These social norms are usually internalized by indoctrination (Postlewaite, 2010) and hence compliance is not necessarily dependent on external sanctions (Elster, 1989). As we are interested in cross-country variation of a *social* norm, we assume benefit morale to differ between countries while being constant within them. Consequently, individuals in a society exhibiting a strong benefit morale have to consider higher psychological costs when deciding to commit benefit fraud.

The payment of insurance is in most countries contingent on individual health status. Since health is at least partly private information, a moral hazard problem arises. Even if a checkup with a physician is necessary to obtain sick pay, anecdotal evidence shows that it is relatively easy to convince a physician to declare one sick without real symptoms. This is confirmed as empirical studies document that the insurance level has a positive impact on the incidence and the duration of absence spells (Johansson and Palme, 2001, 2005; Osterkamp and Röhn, 2007; Frick and Malo, 2008; Puhani and Sonderhof, 2010; Ziebarth and Karlsson, 2010). We assume health to be a continuous rather than a dichotomous variable, which turns moral hazard into a gradual phenomenon ranging from blunt cheating to slight exaggeration of symptoms (Engström and Holmlund, 2007). Hence, an increase in benefit morale reduces at the margin the number of people claiming sick pay (Lindbeck and Persson, 2010). This does not only reduce insurance expenses but also increases its revenues due to more people working. The improved financial situation of the insurance makes it possible to either increase the replacement rate and/or to reduce the insurance fee. Thus, benefit morale might have a positive effect on the generosity of the program. But there is also an effect working in the opposite direction. The smaller the probability of receiving benefits, the less desirable an increased insurance level becomes, compared to a reduced fee. Accordingly, no clear-cut relation may emerge.

Since we investigate publicly legislated insurance programs, the generosity of the program is set in a political context in our model. We investigate the impact of exogenous changes in benefit morale on the political equilibrium replacement rate in a median voter model assuming an exogenous heterogeneity with respect to health. Voters who are risk averse and aware of their exposure to sickness risk decide *ex ante* on the scope of the public insurance. Numerical simulations show for different patterns of sickness shocks a concave relationship between benefit morale and replacement rate. This relationship ranges between positive and slightly negative marginal effects depending on the health pattern and the relevant range of benefit morale. As the impact of benefit morale on the generosity of public sick pay programs is theoretically indeterminate, we turn to an empirical investigation.

Our empirical investigation covers 34 developed countries over the period 1981-2010. Hence we cover more countries than in earlier investigations about determinants of sick pay generosity, i.e. Korpi (1989) and Allan and Scruggs (2004). We measure the generosity of the entitlements as legally binding gross replacement rate in the first week of illness for a single person earning an average production worker wage. Benefit morale is measured by a sur-

vey item in the World Values Survey that is widely used in empirical research on welfare state programs (Algan and Cahuc, 2009; Halla and Schneider, 2008; Heinemann, 2008). In a simple pooled cross-section OLS design we find some evidence for a concave relationship between benefit morale and the generosity of sick pay entitlements that is characterized by a significant and robust positive pattern for low morale countries that flattens for medium to higher morale countries. Hence the data corroborate the numerical predictions of our theoretical model.

This paper contributes to two strands of the literature. First, we add to the research field concerned with the impact of social norms on the design of public policies by adding evidence for benefit morale as additional explanation for cross country diversity in sick pay entitlements. The concept of this paper is closely related to that proposed by Algan and Cahuc (2009), who argue that civic mindedness of individuals allows solving moral hazard problems in the case of insurance against unemployment risks. We transfer Algan and Cahuc's idea to a policy field, that has until now not been scrutinized in this respect: public welfare entitlement programs covering the risk of losing one's work income due to illness. In a very recent contribution Algan et al. (2011) find with cross-country individual data that individual demand for public redistribution is negatively influenced by the individual's trustworthiness and positively by the share of trustworthy people in the population. Since we model the impact of benefit morale as a *socially* shared norm, we obtain these two counteracting effects combined which leads to a concave relationship between norm and generosity in our model. There are some studies that inspect the long run effects of welfare state generosity on work norms (Lindbeck, 1995; Lindbeck et al., 2003; Halla and Schneider, 2008; Heinemann, 2008; Halla et al., 2010), whereas our paper aims at investigating the contrary effect of social norms on institutions. We argue that welfare state institutions and social norms affect each other and are hence *interdependent*. But there are particularly good reasons to investigate also the causal link between social norms and public policy programs: since individuals follow social norms in a rather unreflected way and acquire them involuntarily during their childhood, social norms adapt only very slowly to changing conditions (Lindbeck, 1995; Postlewaite, 2010). In contrast, it is easy to adapt public policy programs to changed conditions. For this reason we deem it particularly worthwhile to investigate the effect of benefit morale on the institutional design of public sick pay programs.

Second, we contribute to the literature on sick pay and welfare state institutions in general. We add benefit morale as a new explanation to the literature on determinants of cross coun-

try diversity in sick pay entitlements. There are so far two empirical studies on determinants of cross-country diversity in sick pay generosity. For a sample of 18 industrialized countries prior to 1980, Korpi (1989) finds that the generosity in public sick pay programs is positively correlated with the political power of left parties. In a more recent sample, the left party effect vanishes while the share of conservative parties is negatively associated with generosity (Allan and Scruggs, 2004). Neither Korpi (1989), nor Allan and Scruggs (2004) take social norms into account as a possible explanation. Furthermore, we add to the theoretical understanding of sick pay insurance from an political economy perspective. The theoretical framework we apply uses elements of the following literature: Engström and Holmlund (2007) model sickness as a continuously distributed utility shock and analyze the impact of sick pay insurance on labor market outcomes. The insurance level is not endogenous in their model and thus the paper makes no proposition concerning institutional choice. Lindbeck and Persson (2010) analyze the impact of social norms on the work decision of insured employees but do not examine its impact on (optimal) insurance levels. Hence we enrich the sickness insurance framework used by Engström and Holmlund (2007) and Lindbeck and Persson (2010) with a political decision process and investigate comparative static effects of benefit morale on the political equilibrium insurance level which has not been done before. The remainder of this paper is organized as follows: Section 2 introduces a simple political economy model of sick pay generosity and furnishes numerical simulations for comparative statics. Section 3 describes the data and the applied econometric method, and presents estimation results as well as some robustness checks. Finally, Section 4 concludes.

## 2 Theoretical Model

### 2.1 Description

The model is set up as follows. There is a large number of risk-averse individuals whose number is normalized to unity. As full employment is guaranteed, there are only two labor force states: either present and working or absent. The individuals gain utility from consumption and are hit by a disutility shock of value  $\phi$  while working. This shock can be interpreted as disutility from sickness due to work effort. Following Engström and Holmlund (2007) and Lindbeck and Persson (2010) we do not model the sickness shock  $\phi$  as a dichotomous but as a continuous random variable which turns health status in a gradual

phenomenon. Individuals are heterogenous in their exposure to this shock which is drawn from probability distributions. In line with Lindbeck and Persson (2010) and Algan and Cahuc (2009) individuals have to bear psychological or stigmatization costs when absent,  $b \geq 0$ . The extent of the costs is associated with the stringency of the prevailing social norm in a society. Hence  $b$  is constant within one society while varying between them. Following Engström and Holmlund (2007) we model a logarithmic consumption utility function that reads for present and absent individuals as follows:

$$u_p = \ln(c_p) - \phi \tag{1}$$

$$u_a = \ln(c_a) - b. \tag{2}$$

As there is no saving, consumption equals after-tax income. Consumption while present at work is  $c_p = w(1 - t)$ , with  $w$  as an exogenously given wage and  $t$  as the tax rate that finances the sick pay benefits.<sup>1</sup> Absent workers are entitled to sick pay benefits amounting to  $c_a = \rho w(1 - t)$  with replacement rate  $\rho$ ,  $0 < \rho \leq 1$ . For simplicity we assume that benefits are taxed at the same rate as the regular wage income.

There exists a reservation value of the utility shock  $\phi$  called  $s$  at which individuals are indifferent between staying at home and going to work. For the marginal individual the disutility of sickness while working equals the reduced consumption utility and psychological costs at home, as shown in equation (3). Here, the psychological costs  $b$  guarantee that individuals in a context with more benefit morale are less likely to be absent, cf. Ichino and Maggi (2000) and Lindbeck and Persson (2010).

$$s = b - \ln \rho \tag{3}$$

Each individual knows her exogenous exposure to the risk, i.e. her probability distribution of  $\phi$ , which is private information. The aggregate shock in the population is a random variable drawn from a publicly known distribution  $F(\gamma)$  with support  $[\underline{\gamma}, \bar{\gamma}]$ , and density  $f(\gamma)$ . As the size of the population equals unity, we can interpret  $F(s)$  as the share of the population

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<sup>1</sup> The economic mechanism at stake here is not dependent on the assumption to finance sick pay by tax. A similar effect can be obtained when sick pay is directly financed by the employer which is common in several countries. In this case higher absence rates lead through reduced output to lower equilibrium wages. Hence we have a similar effect to the price effect in the tax financed model. As we take only budgetary costs into account in our model, while disregarding the output effect, we are rather at the lower bound of effects brought about by norm guided absence behavior.

that works, while  $[1 - F(s)]$  of the population stays at home. With this information we can write the budget equation as:

$$t = \frac{[1 - F(s)] \rho}{F(s) + \rho [1 - F(s)]}. \quad (4)$$

## 2.2 Political Economy Model

The generosity of the sick pay entitlement is set in a political economy framework. The population chooses the generosity of the sick pay insurance,  $\rho$ , in an ex ante plebiscite with a simple majority vote. Due to a binding budget constraint, replacement rates and tax rates are chosen simultaneously. Thus the vote simplifies to a single issue ballot over the replacement rate. The concavity of the utility function guarantees single peaked preferences, which allows the median voter theorem to be applied. As the individuals are heterogenous with regard to sickness risk, the individual with the median exposure to illness has the decisive vote, c.f. Wright (1986) for unemployment insurance and heterogeneity with regard to unemployment probability. Depending on the distribution of the sickness shock within the population, the decisive voter might be exposed to less or more risk than the population on average. Hence we let  $G(\phi)$  represent the cumulated distribution of the utility shock  $\phi$  for the pivotal voter with density  $g(\phi)$ . If the pivotal voter has the same exposure to the risk as the whole population, the political economy solution is maximizing a utilitarian welfare function. To find the winning institutional arrangement, we search for the replacement rate that maximizes the expected utility of the pivotal voter. Substituting the tax rate  $t$  as in (4), the expected utility of the pivotal voter reads as follows:

$$EU_{median} = \int_{\underline{\phi}}^s (\ln \left[ \frac{F(s)w}{F(s) + \rho [1 - F(s)]} \right] - \phi) dG(\phi) + \int_s^{\bar{\phi}} (\ln \left[ \frac{\rho F(s)w}{F(s) + \rho [1 - F(s)]} \right] - b) dG(\phi). \quad (5)$$

Asymmetric information on the individual health situation implies that the decision regarding the replacement rate  $\rho$  also affects the individual decision to work, i.e.  $s$ . According to (3), an increase in generosity leads to a reduced critical value  $s$ , implying that more people are absent. The share of absent workers has repercussions on the insurance terms, as it influences the benefits to tax ratio, i.e. the “price” for any given level of  $\rho$  increases. This

moral hazard effect of the insurance has to be taken into account by the pivotal voter when choosing the optimal replacement rate. Thus she maximizes her expected utility subject to the incentive compatibility constraint that takes the moral hazard effect into account. The Lagrangian reads as follows:

$$L(\rho, s, \lambda) = EU_{median} + \lambda\{s - b + \ln \rho\} \quad (6)$$

When maximizing  $L(\rho, s, \lambda)$  we obtain first-order conditions:

$$\frac{\partial L}{\partial s} = g(s)(b - s - \ln \rho) + \frac{\rho f(s)}{F(s) [F(s) + \rho - \rho F(s)]} + \lambda = 0 \quad (7)$$

$$\frac{\partial L}{\partial \rho} = [1 - G(s)] \frac{F(s)}{\rho [F(s) + \rho - \rho F(s)]} - G(s) \frac{[1 - F(s)]}{[F(s) + \rho - \rho F(s)]} + \frac{\lambda}{\rho} = 0 \quad (8)$$

Assuming there is a maximum, it can be characterized in two optimality conditions<sup>2</sup>:

$$h(s, \rho) = [1 - G(s)] F(s) - G(s) [1 - F(s)] \rho - \frac{\rho f(s)}{F(s)} \equiv 0 \quad (9)$$

$$s(\rho, b) = b - \ln(\rho) \quad (10)$$

These two conditions codetermine optimal  $\rho^*$  and  $s^*$  for an exogenous level of  $b$  and given distribution functions  $F(\phi)$  and  $G(\phi)$ . The first optimality condition (9) takes into account direct and indirect effects of a changed replacement rate on the expected utility of the pivotal voter. The first two terms of  $h(s, \rho)$  represent the standard insurance trade-off between more consumption when absent at probability  $[1 - G(s)]$  and less consumption when present at probability  $G(s)$ . But an increase in  $\rho$  has further (indirect) repercussions, as it increases the absence rate in the population and thus individual costs for one unit of insurance, which is represented by the last term. The second condition simply represents the incentive compatibility condition.

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<sup>2</sup> The sign of the bordered Hesse Matrix,  $|\bar{H}_2|$ , is analytically indeterminate without further assumptions regarding  $F(\phi)$  and  $G(\phi)$ . Simulations with different types of distributions for  $F$  and  $G$  (log-normal, normal, Weibull and Student-t distributions) suggest that  $|\bar{H}_2| > 0$  holds for relevant parameter constellations. We thus assume the second-order condition to be fulfilled.

## 2.3 Comparative Statics

We analyze the impact of changes in the value of the psychological costs  $b$  that reflect the level of benefit morale in a society on the equilibrium value of  $\rho^*$ , i.e. the generosity of the sick pay entitlements. According to the implicit function theorem, changes in  $\rho$  induced by exogenous changes in  $b$  can be written as

$$\frac{\partial \rho^*}{\partial b} = - \frac{\frac{\partial h}{\partial b} + \frac{\partial h}{\partial s^*} \frac{\partial s^*}{\partial b}}{\frac{\partial h}{\partial \rho} + \frac{\partial h}{\partial s^*} \frac{\partial s^*}{\partial \rho}}. \quad (11)$$

Since all the signs of the partial derivatives are well defined except  $\frac{\partial h}{\partial s^*}$ , the direction of the total effect hinges on this partial derivative. From the second-order condition we can deduce a negative denominator.

$$\begin{aligned} \frac{\partial h}{\partial b} &= 0 \\ \frac{\partial h}{\partial s^*} &= -g(s^*)\{F(s^*) + [1 - F(s^*)]\rho\} + f(s^*)\{[1 - G(s^*)] + G(s^*)\rho\} \\ &\quad - \frac{\rho f'(s^*)}{F(s^*)} + \frac{\rho [f(s^*)]^2}{[F(s^*)]^2} >< 0 \\ \frac{\partial s^*}{\partial b} &= 1 > 0 \\ \frac{\partial h}{\partial \rho} &= -\frac{f(s^*)}{F(s^*)} - G(s^*)[1 - F(s^*)] < 0 \\ \frac{\partial s^*}{\partial \rho} &= -\frac{1}{\rho} < 0 \end{aligned} \quad (12)$$

Analytically it is not clear, which of the counteracting effects in  $\frac{\partial h}{\partial s^*}$  prevails. The first term in (12) represents the effects of an increase in the probability of the pivotal voter to be present and working due to a marginal increase in  $s^*$ . This effect reduces the utility gains of an increased insurance, as the changed working decision makes the voter more likely to be a net contributor to the insurance. The second term takes the changed working behavior of the whole population into account. As more people go to work instead of staying at home each unit of insurance is less costly to the voter. We assume that in the relevant range for  $s$ , the probability of a stronger utility shock occurring is not higher than that of a smaller shock, i.e.  $f'(s^*) \leq 0$ . This implies that more severe diseases are less prevalent, which seems plausible. Under this assumption the third term represents the reduction of the negative

moral hazard effect in the optimality condition  $h(s, \rho)$  as weakly less people are marginally affected by increases in  $\rho$  when moving to higher values of  $s$ . Finally the last term captures that when more people go to work the moral hazard costs of an increase in generosity is shared among more people working, which makes this increase in generosity cheaper for the median voter.

In the case of a positive partial derivative  $\frac{\partial h}{\partial s^*}$ , equation (11) shows an unambiguous positive connection between benefit morale and the equilibrium replacement rate. Here, an increase in people going to work brought about by higher benefit morale increases utility gains from increased insurance generosity at the margin for the median voter. These increased marginal gains have to be balanced in the optimum by more generous entitlements that bring higher marginal costs about. Hence, in this case stricter benefit morale leads to more generous entitlements. In the other case, where the partial derivative  $\frac{\partial h}{\partial s^*}$  is negative, the overall effect is negative as the denominator of (11), albeit its positive and negative terms, is strictly negative due to the second-order condition.

Supposing the distributions  $F(\phi)$  and  $G(\phi)$  have the same pattern (welfare maximization), equation (12) simplifies to

$$\frac{\partial h}{\partial s^*} = f(s^*) [1 - \rho] [1 - 2F(s^*)] - \frac{\rho f'(s^*)}{F(s^*)} + \frac{\rho [f(s^*)]^2}{[F(s^*)]^2}. \quad (13)$$

$F(s^*) < 1/2$  and  $f'(s^*) \leq 0$  guarantee that equation (13) is positive, which produces an unambiguously positive effect on the equilibrium replacement rate resulting from an increase in benefit morale. But in the contrary case of  $F(s^*) > 1/2$ , which implies that more than half of the population is present working, the overall effect is again ambiguous since equation (13) consists of a negative and two positive terms. Since empirically there are no countries (at least in Europe) with an absence rate higher than 50 % (Lusinyan and Bonato, 2007), the comparative static effect remains - even in the simple welfare maximization case - indeterminate in the empirically relevant range. To shed light on this analytically indeterminate problem, we run numerical simulations.

## 2.4 Numerical Simulation

To run numerical simulations we have to assume the form of the distribution of  $\phi$  for the median voter and the whole population. One plausible form of the distribution of the sickness

shock is a standard normal distribution of the shock. In order to make the simulation consistent with our interpretation of the shock as a disutility from work induced by sickness, we assume a positive expected value of  $\phi$ . The negative values could be interpreted as pleasure derived from work. Furthermore, in this distribution very small shocks are much more probable than huge shocks, which fits very well with real world health problems.<sup>3</sup> We analyze several parameter constellations and check whether the second-order condition is fulfilled, which is the case for all relevant parameter constellations.

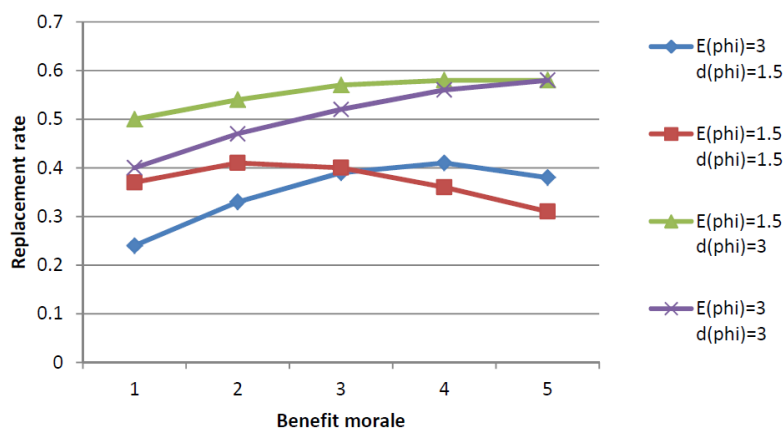


Figure 2: Equilibrium replacement rate depending on benefit morale levels.

Same sickness shock for median voter and the whole population.  $\phi$  follows a standard normal distribution with four scenarios: i) expected damage of 3 and standard deviation of 1.5 ( $E(\phi) = 3, d(\phi) = 1.5$ ); ii)  $E(\phi) = 1.5, d(\phi) = 1.5$ ; iii)  $E(\phi) = 1.5, d(\phi) = 3$  and iv)  $E(\phi) = 3, d(\phi) = 3$ .

As a benchmark case, we assume the pivotal voter to have the same pattern of disutility shock as the aggregate pattern for the whole population, i.e.  $F(\phi) = G(\phi)$  and  $f(\phi) = g(\phi)$  for all values of  $\phi$ . In this case the politically determined replacement rate is maximizing a utilitarian welfare function. We vary the expected scope and the spread of the shock's standard normal distribution and obtain a concave pattern (Figure 2). While the positive price effect prevails at low levels of benefit morale the counteracting probability effect gets stronger at higher benefit morale levels. In some cases (red and blue line) the negative probability effect overcompensates the positive price effect which leads to a hump shaped

<sup>3</sup> Taking health care expenditure as a proxy for the severity of health problems, OECD data show that these expenditures are highly concentrated on individuals older than 60 years (OECD, 1998, p. 227). We take the concentration of severe health problems among a rather small part of the population as indication that more serious diseases appear overall with a smaller probability than less serious ones.

pattern. Concerning the resulting absence rate, we obtain a decreasing slope between benefit morale and absence rate for all patterns of the sickness shock (not shown).

Now we lift the assumption that the decisive voter is characterized by the same pattern of shock as the whole population on average but keep the standard normal form for the shock (Figure 3). The political equilibrium is hence no longer maximizing a utilitarian welfare function. In the case that the absence spell of the median is smaller than on average, the decisive voter prefers tax cuts over increased insurance even for low levels of benefit morale, since it is very unlikely for her to stay at home (blue line). Conversely, if the decisive voter is exposed to a higher level of expected damage than the average level for the population, the equilibrium replacement rate is higher (red line). This happens because the pivotal voter is more likely to be a receiver of payments than the rest of the population and hence profits disproportionately from extended insurance coverage. Hence we find the same redistributive pattern as Wright (1986) for unemployment insurance.

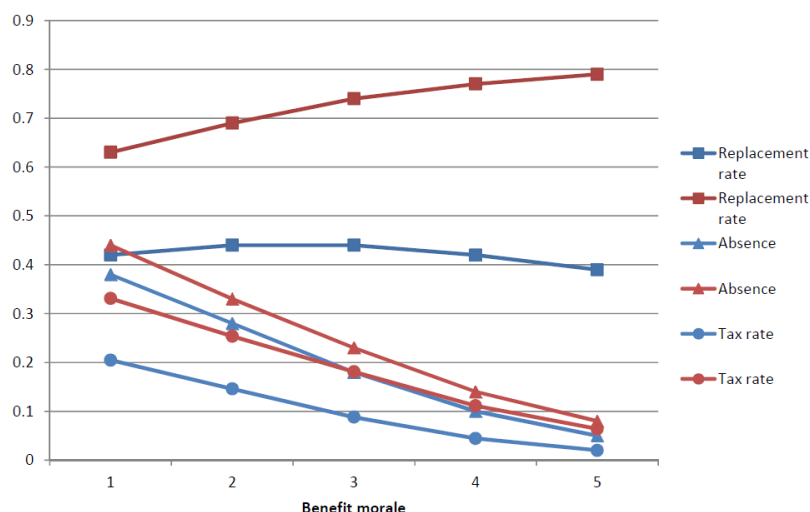


Figure 3: Replacement, absence and tax rates for two cases: higher exposure to risk for the median than for the whole population (red) or lower risk (blue).

In contrast to Algan et al. (2011) who investigate the relationship between individual trustworthiness and general redistribution, we obtain in some cases a negative relationship between benefit morale and generosity. This negative relationship is produced by two properties of the distribution of the sickness shock that affect the sign of the partial derivative  $\frac{\partial h}{\partial s^*}$ : (i) a distribution that is concentrated at low levels of  $\phi$  and (ii) a flat density function at its positive tail. (i) implies even for small values of benefit morale a high rate of work-

ers that are present and a small density  $f(s)$ , which turns the indeterminate derivative  $\frac{\partial h}{\partial s^*}$  rather negative. This comes about as high  $F(s)$  and small  $f(s)$  render the positive terms in equation (13) smaller and the negative terms larger in amount. Furthermore (ii) means that the absolute value of  $f'(s)$  is small, which makes the positive third term of the partial derivative  $\frac{\partial h}{\partial s^*}$  also smaller. These effects increase the likelihood that the sign of  $\frac{\partial h}{\partial s}$  turns negative.

The economic intuition is that if the expected shock is sufficiently small, the individuals prefer to go to work instead of staying at home even for small values of benefit morale. With a sufficiently small probability of receiving an insurance payment, the desired insurance level for the pivotal voter decreases. Furthermore, a shock with small spread features rather small density values for a given critical value  $s$  which means that more benefit morale induces only few additional people to go to work. Hence benefit morale has only a negligible effect on the “price” for sick pay insurance. Finally, the density function with standard normal distribution is rather flat at the tails. Hence an increase in the critical value  $s$  brought about by a higher benefit morale no longer significantly reduces the marginal moral hazard effect of the insurance. Thus more benefit morale in the population does not make an increase in insurance significantly less costly in terms of the number of people being induced to stay at home. Taken together, these effects translate into a negative relationship between benefit morale and sick pay generosity at high levels of benefit morale. We obtain basically the same concave results when assuming different types of distribution for the shock.<sup>4</sup>

We conclude from the simulation that the pattern between benefit morale and the replacement rate is concave. But the relationship may range from a strong positive to a slightly negative impact depending on the distribution of the shock and the relevant range of benefit morale values. But as these results hinge on highly speculative patterns of sickness, we turn to an empirical investigation. In the following section we empirically analyze the determinants of sick pay entitlements in a pooled cross section model, with benefit morale as an additional explanation not present in the previous literature.

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<sup>4</sup> We analyzed lognormal, Student-t or Weibull type distribution for the shock. To guarantee comparability to the standard normal simulation, we kept the same expected damage and standard deviation of the shock when changing the type of distribution. The concave pattern holds, but the peaks are in some cases at higher levels of benefit morale than in the standard normal distribution case. Again, for all the parameter constellations the second-order condition are fulfilled.

## 3 Empirical Evidence

### 3.1 Data

Our data covers 34 developed countries between 1981 and 2010.<sup>5</sup> Our dependent variable is the legally binding gross replacement rate in the first week of illness for a single household earning an average production wage. We do not discern whether the sick pay is financed by social contributions, general tax revenue or the employer, as the effects outlined in the theoretical model are qualitatively the same (see footnote 1). The gross replacement rate has a major advantage over the net replacement rate: The gross replacement rate is independent of the progressivity of the income tax system. Since we suppose benefit fraud to take place in short absence spells, the generosity of sick pay is measured during the first week of illness and we take waiting days into account.

The data on sick pay entitlements is taken from three different sources to obtain a sufficient number of observations. For the 1980s and 1990s we use the Social Citizenship Indicator Program data set provided by the Swedish Institute for Social Research (SOFI) which covers 18 major developed countries from 1930 to 2000 (Korpi and Palme, 2007). For the years after 2000 we expand our sample to the whole EU-27 by using the EU's Mutual Information System on Social Protection (MISSOC). For countries that are not member of the European Union we use the Social Security Programs Throughout the World Series published by the US Social Security Administration in cooperation with the International Social Security Association (ISSA).<sup>6</sup> Generally, there is much more variation between countries than over time. The replacement rates range from no entitlement in the first week in some anglophone countries to full replacement of the wage in some Central and North European countries. The bulk of the countries in contrast guarantees a gross replacement rate in the first week strictly between zero and one.

The variable of interest, benefit morale, is taken from the World Values Survey (WVS), waves one to five. The WVS is a survey on attitudes on a worldwide base, representative for each

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<sup>5</sup> These countries are: Australia, Austria, Belgium, Bulgaria, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, the United Kingdom and the United States.

<sup>6</sup> To guarantee most accurate and consistent data we cross-checked the values between the different sources, where possible, and reviewed the literature on sick pay institutions (Seffen, 1980; Salowsky and Seffen, 1993). Countries covered over the whole period and hence collected from different sources show a very consistent pattern over time in our data.

country - at least in the developed countries included in our sample.<sup>7</sup> The question for benefit morale reads: “Do you think it can always be justified, never been justified or something in between to claim government/state benefits to which you have no rights?” The scale reaches from 1 for “Never justifiable” to 10 for “Always justifiable”. This survey item is a recognized measure for benefit morale and has been widely used in empirical research on social norms and the welfare state (Algan and Cahuc, 2009; Halla and Schneider, 2008; Heinemann, 2008). We consider four of the first five waves of the WVS: 1981-1982 (first wave), 1989-1990 (second wave), 1999-2001 (fourth wave), and 2004-2008 (fifth wave). Obviously, the polling for each wave takes place over more than one year. To solve this problem, we work with waves as our time unit. Since all the other controls are measured annually and not in the wave-scheme of the WVS, we take country averages over the duration of a wave to obtain a value for this wave. As the World Values Survey does not cover the benefit morale item in all countries in each wave, we have an unbalanced panel covering 34 countries in four waves over the periode 1981-2010.

We follow Algan and Cahuc (2009) in taking country shares of individuals with strong benefit morale as measure for a country’s benefit morale. Hence, we label all individuals that have answered “Never justifiable” as individuals with strong benefit morale. The country average ranges from less then a quarter in Greece to around 90 percent in Denmark and Malta. The country’s levels of benefit morale show a very stable pattern over time in our sample which supports our contention that benefit morale is a social norm transmitted from generation to generation. Only in Finland we observe one discordant value. The share of participants answering “Never justifiable” dropped in Finland from almost two thirds in the first wave to a mere twelve percent in 1990 which is the lowest value in our sample. In the mid-1990s this value again stabilized at over 60 percent.<sup>8</sup> Thus this observation is an outlier in the strict sense of the term and we disregard it for our investigation. We will check whether the exclusion of this outlier has a bearing on our results. You find the sick pay generosity and benefit morale data in table 2 in the data appendix.

We will now turn to the controls. First, there are political factors drawn from the literature on comparative welfare state institutions that potentially affect public sick pay programs (Korpi, 1989; Allan and Scruggs, 2004). The political direction of the government is measured

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<sup>7</sup> The number of respondents is for all countries and waves beyond 500. In some waves and countries it reaches more than 2,000.

<sup>8</sup> Finland’s situation in 1990 was characterized by a huge economic downturn after the desintegration of the Soviet Union, Finland’s neighbour and biggest trading partner.

by the government partisanship index which is taken from the Comparative Political Data Set I (Armingeon et al., 2009) and III (Armingeon et al., 2010) in which higher values are associated with more left wing politicians in the cabinet. To capture the path dependency of political decisions, we take the partisanship index as average over the time measured from 1970 onwards. We code the communist countries before 1990 as left governments.<sup>9</sup> Second, there are economic factors. Economic problems might force governments to reform welfare programs. For that reason our model contains real GDP growth as a proxy for economic shocks. The public budget might also reflect economic pressure on governments to reform welfare state institutions. But we opted against the inclusion of public budget measures for economic and practical reasons. Sick pay makes up only a very small part of the welfare state expenditures and due to bad data sources we would lose already sparse observations when including public budget measures. GDP per capita measured in 2005 US dollars accounts for the absolute level of wealth in a country. Rodrik (1998) finds that public welfare programs are a means of reducing external risk from exposure to the world market. To capture this argument we control for economic openness, measured as the sum of imports and exports as a share of a country's GDP. The economic controls are taken from IMF sources and the Penn World Tables. Third, the labor market has repercussions on the absence decision taken by those entitled to sick pay. Ichino and Riphahn (2005) and Pfeifer (2010) have shown that fear of losing one's job reduces the incidence and the duration of sick spells. This fear is reduced when job opportunities are abundant, hence we include the unemployment rate which is taken from IMF sources. For details, see data appendix.

### 3.2 Econometric Method and Results

In order to keep as many observations as possible in our analysis, we apply a pooled cross-section design. Since the generosity variable shows much higher variation between the countries than over time, we abstain from the inclusion of country dummies to keep this variation in the model. Since the literature postulates a negative long-term impact of welfare state benefits on work norms, i.e. in the inverse direction, we might run into a reversed causality problem (Lindbeck, 1995; Lindbeck et al., 2003; Halla and Schneider, 2008; Heinemann, 2008). But due to the very temporary character and rather small amount paid under sick

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<sup>9</sup> I am grateful to Christian Bjornskov who suggested this way of measuring the communist party legacy. Starting the measurement of the governmental partisanship with the first free elections does not fundamentally change our results.

pay compared to other welfare programs, we largely doubt that its generosity has a strong and persistent bearing on the benefit morale level prevalent in a country. Unemployment and disability insurance are much more concerned in this respect. As political processes work slowly, the independent variables are generally lagged which helps also to mitigate the potential reverse causality problem. To capture the concave relationship derived from our theoretical model we include also the quadratic squares of benefit morale as independent variable. To control for general time trends we add time dummies. Hence we analyze the correlation between benefit morale and sick pay insitutions by running the following type of regression:

$$RR_{c,t} = \gamma_1 + \beta_1(BM_{c,t-1}) + \beta_2(BM_{c,t-1})^2 + \gamma_2 X_{c,t-1} + \gamma_3 d_t + \epsilon_{c,t}. \quad (14)$$

In this equation  $RR_{c,t}$  represents the gross effective replacement rate for a single household in country  $c$  at date  $t$ ;  $BM_{c,t-1}$  denotes the benefit morale in country  $c$  at date  $t - 1$ ; the vector  $X_{c,t-1}$  includes lagged control variables,  $d_t$  are time (wave) dummies, while  $\epsilon_{c,t}$  is an error term. Since the institutional data in the last century are only available every five years and the WVS is polled apperiodically, we associate the last year of a WVS-wave with the next available generosity data point measured after a lag of at least one year.<sup>10</sup> In order to guarantee consistent standard error estimates, we use heteroskedasticity robust standard errors that take clustering by country into account.<sup>11</sup> You find the regression results in Tables 3 to 5.

[Insert table 3 about here]

We find some evidence for a concave relationship between benefit morale and the generosity of sick pay insurance in our sample. In preliminary regressions we find that governmental partisanship, the trade openness and the transition economy variables are the only controls to be significantly correlated with sick pay generosity. Accordingly, we present regressions with theses significant controls and combined with the other non-significant controls in table 3. In these models we obtain a quite robust concave relationship between benefit morale

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<sup>10</sup> Accordingly, benefit morale and lagged controls from 1981-82 are associated with the replacement rate in 1985, 1989-90 norms with institutions in 1995, 2001-02 with 2004 and finally 2004-08 with entitelments in 2010.

<sup>11</sup> Country panels can be interpreted as multilevel data clustered by country over time. Accordingly, the multilevel error structure should be taken into account. Estimates of the error structure fare reasonably well in comparative politics contexts characterized by small number of observations (Franzese, 2005).

and the sick pay generosity. The significance niveau of the coefficients of interest range from the 5 % to 15 % niveau, depending on the included controls. When additionally including GDP per capita (column 3) or when combining GDP with the unemployment rate (column 5), the significance niveau for  $\beta_2$  or both coefficients of interest fall below the 10 percent niveau, respectively. But even in these two models the combined marginal effect is significant positive on the ten percent niveau for low levels of benefit morale. The significant positive relationship of a country's benefit morale and the sick pay generosity for low benefit morale countries is hence robust to the inclusion of the different controls. In contrast, the negative marginal effect at higher levels of benefit morale is insignificant in some of the models (columns 3, 5 and 7) or confined to only one observation with a benefit morale level beyond 0.85 (columns 1, 2 and 8). Hence we conclude, that the data show a robust positive relationship between the level of a country's benefit morale and the generosity of sick pay entitlements for countries with low levels of benefit morale. Whereas the negative sloped upper part of the hump shape relationship is rather dubious since it is significant only in two of the eight models in relevant ranges (columns 4 and 6). This result fits the predictions of our theoretical model, stating that at low levels of benefit morale the price effect prevails the probability effect and hence more benefit morale leads to an increase in generosity.

The effects are economically sizable. Figure 4 illustrates the concave relationship by plotting the marginal effect and the 10 % confidence interval associated with changes in benefit morale taken from the full model with all controls (column 8 in table 3). For an observation with a benefit morale level of less than 0.5 increases in benefit morale are associated with more generous sick pay entitlements. Hence, moving from an observation with a benefit morale level of 0.4 to one with 0.5 is associated with an increase of approximately 7.6 percent points in generosity. In the range between 0.5 and 0.85 the effect is not significantly different from zero on the 10 % niveau. For the one observation higher than 0.85, the negative effect of benefit morale turns marginally significant. Since the negative impact is not robust to the inclusion of additional controls, the marginal effect of 8.3 percentage points less generosity for an increase from 0.85 to 0.9 in benefit morale should be taken with some caution. Regarding the controls, countries with more left wing governments are associated with significantly more generous sick pay institutions, which confirms earlier findings (Korpi, 1989; Allan and Scruggs, 2004). Open economies are also highly significantly linked to more generous institutions as in the literature (Rodrik, 1998). The effect of the unemployment rate, GDP per capita, economic growth and the transition dummy on sick pay generosity is

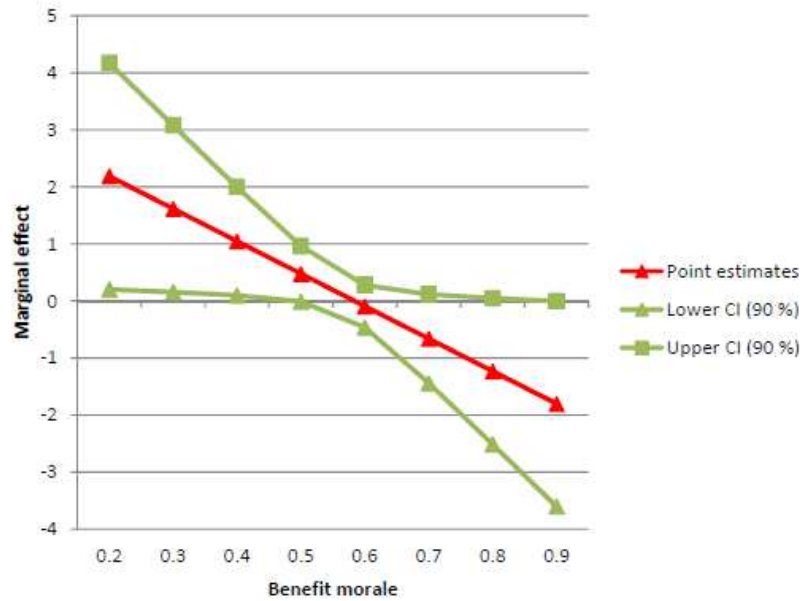


Figure 4: Marginal effects and 10 % confidence interval from benefit morale on sick pay replacement rate dependent on the level of benefit morale. Estimates taken from the OLS model including all controls (model 8 in table 3)

in none of the presented models significantly different from zero.

### 3.3 Robustness checks

As robustness checks, we address potential extreme response bias in the WVS, the limited range of the dependent variable and check whether the results are robust to the exclusion of single observations. It is a well known fact, that in some cultures people are reluctant to choose extreme values in surveys (Johnson et al., 2005). For that reason we construct a wider definition of benefit morale than the definition proposed by Algan and Cahuc (2009). Accordingly, we assign individuals that have answered the benefit morale item in the two most negative categories with a strict benefit morale. The replication of the table 3 regressions with the wider defined benefit morale are presented in table 4 in the appendix. The results of these regressions cast further doubt on the negative impact from benefit morale on generosity in high morale countries, but corroborates the positive pattern at lower levels of benefit morale. Albeit obtaining in four out of eight specifications significant negative  $\beta_2$  coefficients, the marginal effect of the variable of interest (the linear and squared effect taken

together) is only in one of these models (column 6) negatively significant in the relevant benefit morale range.

Given our data structure with a limited range of the dependent variable between zero and one, a tobit model could be considered. With 17 observations on the upper limit and 12 observations on the lower limit in the whole sample, it could be argued, that the generosity of sick pay insurance is a latent variable that can only be observed in this range. Hence it could be worthwhile to apply a tobit model that fits a model to the latent dependent variable. But censored maximum likelihood estimators used for tobit models have also some drawbacks. Contrary to the OLS approach the consistency property of the estimator depends critically on the normality assumption for the distribution of the standard errors. Unfortunately, sound test statistics for this assumption are only available for samples larger than 500 (Drukker, 2002). For that reason we cannot properly test for this crucial distributional assumption in our sample. Due to this caveat we prefer OLS to tobit models and run the latter only as a robustness check. Disregarding the distributional assumption, tobit models fare sufficiently well in small samples (Paarsch, 1984). The results for the two-limit tobit models are presented in table 5 in the appendix. The concave relationship between benefit morale and sick pay replacement rate is robust to the tobit estimation technique.

In order to see whether the results are driven by single observations, we dropped one observation at once and rerun the full specified model (table 3, column 8). In some of these regressions (not shown) the coefficients of interest's significance niveau dropped marginally under the ten percent niveau. But more importantly, the marginal combined positive effect stayed within the ten percent significance niveau in all but one regressions. Only when dropping Belgium in the early 1980s from the observations the significance niveau of the combined marginal effect exceeded slightly the ten percent niveau. Hence the positive pattern at low morale level is quite robust to the exclusion of single observations. Finally, we rerun all the table 3 models including the outlier observation (Finland in wave 2) that was excluded for economic reasons and find that the concave pattern is not robust to the inclusion of this outlier observation. But since we consider the exclusion of this peculiar observation reasonable, we present the results obtained without this outlier.

## 4 Conclusion

We analyze the impact of cross-country diversity of a social norm that penalizes committing benefit fraud, called “benefit morale”, on the generosity of public sick pay entitlements. We model the decision on insurance generosity as a political equilibrium in a median voter model under exogenous heterogeneity with respect to health. The comparative static effect of an exogenous change in a society’s benefit morale level on the equilibrium replacement rate is analytically indeterminate due to counteracting effects. Benefit morale reduces insurance costs as less people claim benefits. The reduced price might lead to an increased insurance level, but the reduced probability to profit from the insurance works in the opposite direction. Numerical simulations suggest a concave relation between benefit morale and insurance generosity for a variety of parameter constellations. This implies that the price effect prevails for low levels of benefit morale and is increasingly reduced by the probability effect for larger values of benefit morale. As the peak point and the amount of the curvature hinge on the highly speculative pattern of the sickness shock and the relevant range of benefit morale, we turn to an econometric investigation.

Our dataset is an unbalanced panel consisting of 78 observations in 34 developed economies in the period 1981-2010. The dependent variable is the legally binding sick pay replacement rate before taxes, paid in the first week of illness to a single individual. Benefit morale is measured by a widely used item in the World Values Survey asking whether committing benefit fraud is justifiable. We find some evidence for a concave relationship between a country’s level of benefit morale and the generosity of the public sick pay entitlements in our sample. The significant positive relationship between benefit morale and sick pay generosity for low morale countries is robust to a wider definition of the benefit morale measure and to the application of tobit models that address the limited range of the dependent variable. Neither are the results driven by single observations (except the peculiar outlier observation that we excluded from our analysis for economic reasons). In contrast, the negative sloped part in the higher range of benefit morale is more dubious. Hence we conclude a quite robust positive concave relationship between benefit morale and sick pay generosity for low morale countries that flattens for medium to higher morale countries. A certain level of benefit morale could accordingly be seen as a precondition for the median voter to favor more generous sick pay entitlements. Beyond this certain level, benefit morale seems to have no further bearing on the replacement rate.

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## 5 Appendix

### 5.1 Data Appendix

**Sick pay replacement rate** measures the relation of the sick pay benefit before taxes to the gross wage of a average production worker. Sources: Korpi and Palme (2007) for 1985 and 1995: <https://dspace.it.su.se/dspace/handle/10102/7> .

EU's mutual information system on social protection (MISSOC) for 2004 and 2010:

<http://ec.europa.eu/social/main.jsp?catId=815langId=en>.

Social Security Programs throughout the World Series published by the US Social Security Administration in cooperation with the International Social Security Association for 2004 and 2010: <http://www.ssa.gov/policy/docs/progdesc/ssptw/index.html>.

**Benefit morale** is the share of the respondents in a country who have answered that it could never be justified to claim government benefits to which one had no rights. Source: the combined five-wave World Values Survey / European Values Survey, waves one to five: [www.worldvaluessurvey.org](http://www.worldvaluessurvey.org).

**Benefit morale (wider definition)** is the share of the respondents in a country who have answered the two most negative categories out of ten to the benefit morale item in the WVS/EVS. Source: see above.

**Government partisanship** measures the partisanship of governments according to the Schmidt indicator on a five point scale as an average from 1970 onwards. Higher levels are associated with more left wing cabinet members. We coded the governments of communist countries before 1990 with five, the highest possible value. Source: Armingeon et al. (2009) for the years before 1990; Armingeon et al. (2010) for the years after 1990.

**GDP per capita** measures the GDP per capita in thousand 2005 US dollars. Source: Penn World Tables (Version 7.0).

**Unemployment rate.** Source: IMF World Economic and Financial Surveys.

**Economic openness** measures the sum of imports and exports as a share of GDP in current prizes. Source: Penn World Tables (Version 7.0).

**Real GDP growth rate** is measured as percentage change in GDP from the previous year in shares. Source: Penn World Tables (Version 7.0).

**Transition dummy** distinguishes former communist from non-communist countries. It takes the value one for the following countries: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

Table 1: Summary Statistics

Variables	Obs.	Mean	Standard deviation			Min	Max
			(overall)	(between)	(within)		
Sick pay generosity (gross repl. rate)	N=78 n=34	.522	.361	.355	.030	0	1
Benefit morale (population share)	N=78 n=34	.643	.130	.139	.047	.239	.896
Benefit morale (wider definition)	N=78 n=34	.754	.115	.125	.033	.379	.924
Govern. partisanship (Schmidt Indicator)	N=78 n=34	2.65	1.07	1.07	.19	1	4.4
Unemployment rate (percent)	N=70 n=32	7.66	3.86	4.18	1.74	0.53	17.6
GDP per capita (th 2005 US-\$)	N=78 n=34	25.725	9.726	10.793	4.637	5.987	60.604
Real GDP growth (percent change)	N=78 n=34	3.28	2.06	1.67	1.46	-1.13	10.07
Trade openness (percent of GDP)	N=78 n=34	79.24	42.63	48.82	9.85	19.11	264.1

Table 2: Sick pay replacement rate and benefit morale level

Country	Gross replacement rate				Country's level of benefit morale			
	1985	1995	2004	2010	Wave 1	Wave 2	Wave 4	Wave 5
Australia	0	0	0	0	0.74			0.73
Austria	1	1	1	1		0.69	0.59	
Belgium	1	1	0.86	0.86	0.66	0.53	0.54	
Bulgaria			0.8	0.76			0.7	0.58
Canada	0	0	0	0	0.61	0.70	0.71	0.67
Czech Republic			0.43	0.31			0.65	
Denmark	0.6	0.57	0.51	0.52	0.89	0.81	0.83	
Estonia			0.69	0.4			0.36	
Finland	1	1	1	1	0.65	0.12	0.5	0.55
France	0.29	0.29	0.29	0.29	0.39	0.38	0.41	0.41
Germany	0.86	1	1	1		0.63	0.64	0.63
Greece			0.22	0.13			0.24	
Hungary			0.8	0.7			0.76	
Iceland			0	1			0.68	
Ireland	0.14	0.14	0.15	0.15	0.72	0.68	0.7	
Italy	0.29	0.29	0.29	0.29	0.82	0.65	0.65	0.75
Japan	0.34	0.34	0.43	0.38	0.68	0.67	0.64	0.64
Latvia			0.67	0.67			0.62	
Lithuania			0.84	0.54			0.55	
Luxembourg			1	1			0.46	
Malta			0.57	0.57			0.85	
Netherlands	0.54	0.5	0.7	0.7	0.82	0.74	0.78	0.81
New Zealand	0	0	0	0				0.71
Norway	1	1	1	1	0.80	0.79		0.56
Poland			0.8	0.8			0.54	0.53
Portugal			0.31	0.37			0.58	
Romania			0.75	0.75			0.70	0.68
Slovakia			0.42	0.42			0.37	
Slovenia			1	0.9			0.49	0.41
Spain			0.34	0.34			0.56	0.58
Sweden	0.77	0.63	0.69	0.69	0.81	0.74	0.55	0.62
Switzerland	1	1	1	1		0.73		0.77
United Kingdom	0.12	0.11	0.17	0.13	0.73	0.69	0.66	0.65
United States	0	0	0	0	0.76	0.68	0.64	0.68

Sources: see descriptions above.

## 5.2 Regression results

Table 3: Regression results

	Gross replacement rate for a single in the first week of illness							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(OLS)	(OLS)	(OLS)	(OLS)	(OLS)	(OLS)	(OLS)	(OLS)
Benefit morale	3.4456** (1.6669)	3.1049* (1.8181)	3.1738* (1.8085)	3.7046** (1.6302)	2.9899 (1.8915)	3.4563* (1.7483)	3.4230* (1.7998)	3.3273* (1.8488)
B-m squared	-2.8642* (1.4666)	-2.6632* (1.5589)	-2.6183 (1.6116)	-3.1060** (1.4280)	-2.4977 (1.6610)	-3.0202* (1.5008)	-2.8506* (1.5964)	-2.8514* (1.6193)
Gov. partisanship	0.2358*** (0.0582)	0.2547*** (0.0533)	0.2384*** (0.0573)	0.2312*** (0.0582)	0.2578*** (0.0510)	0.2443*** (0.0497)	0.2341*** (0.0578)	0.2479*** (0.0481)
Trade openness	0.0033*** (0.0010)	0.0037*** (0.0010)	0.0030** (0.0012)	0.0037*** (0.0009)	0.0035*** (0.0011)	0.0042*** (0.0008)	0.0033*** (0.0011)	0.0040*** (0.0009)
Transition	-0.2254 (0.1403)	-0.1919 (0.1567)	-0.0506 (0.2252)	-0.2175 (0.1451)	-0.0711 (0.2152)	-0.1623 (0.1569)	-0.0511 (0.2230)	-0.0719 (0.2112)
Unemployment rate		-0.0125 (0.0112)			-0.0054 (0.0102)	-0.0156 (0.0111)		-0.0097 (0.0108)
GDP per capita			0.0084 (0.0067)		0.0075 (0.0067)		0.0081 (0.0062)	0.0058 (0.0060)
Real GDP growth				-0.0215 (0.0222)		-0.0319 (0.0238)	-0.0197 (0.0214)	-0.0283 (0.0238)
Wave dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	78	70	78	78	70	70	78	70
n	34	32	34	34	32	32	34	32
R <sup>2</sup>	0.50	0.50	0.51	0.51	0.51	0.52	0.52	0.53
F	7.26	13.61	6.47	6.03	11.87	11.82	5.33	10.18
df	8	9	9	9	10	10	10	11

Heteroskedasticity robust standard errors, clustered by country, in parentheses. Constant not shown.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 4: Regression results with wider defined benefit morale

	Gross replacement rate for a single in the first week of illness							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(OLS)	(OLS)	(OLS)	(OLS)	(OLS)	(OLS)	(OLS)	(OLS)
Benefit morale (wide definition)	5.1587* (2.7843)	4.9996* (2.7995)	4.8259 (2.9742)	5.3781* (2.6959)	4.6031 (3.0159)	5.4056* (2.7150)	5.0366* (2.9231)	5.0410* (2.9478)
B-m squared (wide definition)	-3.6276* (2.0889)	-3.6024* (2.0586)	-3.3740 (2.2391)	-3.8061* (2.0212)	-3.2495 (2.2481)	-3.9518* (1.9950)	-3.5449 (2.1991)	-3.6288 (2.1946)
Gov. partisanship	0.2389*** (0.0599)	0.2594*** (0.0560)	0.2414*** (0.0592)	0.2351*** (0.0598)	0.2607*** (0.0539)	0.2509*** (0.0525)	0.2378*** (0.0595)	0.2530*** (0.0514)
Trade openness	0.0033*** (0.0010)	0.0036*** (0.0010)	0.0029** (0.0012)	0.0036*** (0.0010)	0.0034*** (0.0011)	0.0041*** (0.0008)	0.0032*** (0.0011)	0.0039*** (0.0010)
Transition	-0.2376 (0.1472)	-0.1989 (0.1582)	-0.0555 (0.2302)	-0.2310 (0.1511)	-0.0762 (0.2195)	-0.1719 (0.1591)	-0.0552 (0.2279)	-0.0784 (0.2154)
Unemployment rate		-0.0141 (0.0104)			-0.0067 (0.0097)	-0.0173 (0.0107)		-0.0111 (0.0107)
GDP per capita			0.0088 (0.0065)		0.0075 (0.0066)		0.0085 (0.0061)	0.0059 (0.0059)
Real GDP growth				-0.0185 (0.0231)		-0.0292 (0.0247)	-0.0169 (0.0222)	-0.0255 (0.0247)
Wave dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	78	70	78	78	70	70	78	70
n	34	32	34	34	32	32	34	32
R <sup>2</sup>	0.50	0.51	0.52	0.51	0.52	0.52	0.52	0.53
F	8.85	15.52	7.59	7.00	12.61	12.62	6.12	10.53
df	8	9	9	9	10	10	10	11

Heteroskedasticity robust standard errors, clustered by country, in parentheses. Constant not shown.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 5: Tobit regression results

	Gross replacement rate for a single in the first week of illness							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(tobit)	(tobit)	(tobit)	(tobit)	(tobit)	(tobit)	(tobit)	(tobit)
Benefit morale	5.1535** (2.5272)	4.7545* (2.5949)	4.8220* (2.6283)	5.5016** (2.4927)	4.6191* (2.6601)	5.1995** (2.5399)	5.1174* (2.6361)	4.9874* (2.6370)
B-m squared	-4.4811* (2.2499)	-4.2732* (2.2809)	-4.2101* (2.3414)	-4.8075** (2.2101)	-4.0908* (2.3484)	-4.7178** (2.2309)	-4.4814* (2.3434)	-4.4673* (2.3265)
Gov. partisanship	0.3605*** (0.1278)	0.4058*** (0.1323)	0.3558*** (0.1259)	0.3527*** (0.1265)	0.3959*** (0.1271)	0.3889*** (0.1255)	0.3500*** (0.1253)	0.3849*** (0.1229)
Trade openness	0.0053*** (0.0018)	0.0064*** (0.0018)	0.0050** (0.0020)	0.0058*** (0.0017)	0.0063*** (0.0018)	0.0070*** (0.0016)	0.0054*** (0.0019)	0.0068*** (0.0017)
Transition	-0.4941* (0.2807)	-0.4944 (0.3039)	-0.2061 (0.3818)	-0.4793* (0.2822)	-0.2216 (0.3824)	-0.4524 (0.2965)	-0.2191 (0.3798)	-0.2493 (0.3827)
Unemployment rate		-0.0161 (0.0152)			-0.0041 (0.0140)	-0.0192 (0.0150)		-0.0091 (0.0146)
GDP per capita			0.0144 (0.0117)		0.0165 (0.0116)		0.0131 (0.0113)	0.0128 (0.0116)
Real GDP growth				-0.0284 (0.0272)		-0.0405 (0.0279)	-0.0227 (0.0262)	-0.0311 (0.0288)
Wave dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	78	70	78	78	70	70	78	70
pseudo-R <sup>2</sup>	0.36	0.40	0.38	0.37	0.42	0.42	0.39	0.43
Obs lower limit	12	8	12	12	8	8	12	8
Obs upper limit	17	17	17	17	17	17	17	17
df	8	9	9	9	10	10	10	11

Censored maximum likelihood estimation with censoring at zero and one. Constant not shown.

Heteroskedasticity robust standard errors, clustered by country, in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$