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Abstract

This paper analyzes the impact of a country's level of benefit morale on generosity of sick pay entitlements by means of a political economy model and an empirical investigation. Higher benefit morale reduces the incidence of absence. On the one hand, this makes insurance cheaper with the usual demand side reaction. On the other hand, being absent less often, the voter prefers less insurance. The former effect dominates at lower, the latter at higher levels of benefit morale. We present empirical evidence for both effects in a sample of 31 countries between 1981 and 2010.

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 statutory sick pay benefits across developed countries, ranging from full replacement of the earned wage in some European countries to no benefits at all in the USA. Compared with other welfare programs, sick pay benefits display a particularly vast institutional diversity. This institutional diversity corresponds to considerable variation in average sickness absence days in OECD countries, ranging from four to 29 days per year per employee (Ziebarth and Karlsson, 2010).

We establish that cross-country differences in social norms against benefit fraud can explain cross-country diversity in mandatory sick pay benefits. Social norms are defined as socially shared beliefs about how one ought to behave while compliance is enforced either by informal social sanctions (Fehr and Gächter, 2000) or by internalization (Elster, 1989). This social norm regarding benefit fraud will be subsequently referred to as "benefit morale." In some countries people are more tolerant towards their fellow citizens committing benefit fraud compared to countries where the population exhibits a stronger sense of benefit morale. These differences can be substantial even within Europe. It has been theoretically (Lindbeck and Persson, forthcoming) and empirically (Ichino and Maggi, 2000) shown that social norms influence absence behavior, which in turn might affect choices over sick pay insurance. Hence, we present a politcal economy model and an empirical investigation analyzing the impact of benefit morale on the generosity of mandatory sick pay.

Since this paper is concerned with publicly legislated insurance programs, the generosity of sick pay benefits is politically set in our model. We investigate the impact of exogenous changes in benefit morale on the political equilibrium replacement rate in a median voter model. Voters who are risk averse and aware of their exposure to sickness risk decide ex ante on the scope of the public insurance. Since sick pay insurance is plagued by moral hazard problems and benefit fraud due to asymmetric information about individual health status, benefit morale plays a role in the absence decisions of the insured.[1] Here, benefit morale is modeled as psychological costs incurred by individuals who commit benefit fraud. Therefore, when assuming a gradual health status, an increase in benefit morale reduces at the margin the number of people claiming sick pay. This not only reduces the expenses incurred by

[1] Even if a checkup with a physician is necessary to obtain sick pay, anecdotal evidence suggests that it is relatively easy to convince a physician to declare one sick without any real symptoms—at least for a short spell. This is supported by empirical studies documenting that the insurance level has a positive impact on the incidence and the duration of absence spells (Johansson and Palme, 2005; Osterkamp and Röhn, 2007; Frick and Malo, 2008; Puhani and Sonderhof, 2010; Ziebarth and Karlsson, 2010).

the insurance program but also increases its revenues due to more people working. In sum the changed working behavior in the whole population reduces, ceteris paribus, the price for insurance leading to a higher demand for insurance. But there is also an effect working in the opposite direction. The smaller the probability of receiving benefits for the voter due to a stricter benefit morale, the less desirable an increased insurance level becomes, compared to a reduced fee. The overall effect depends on the absolute magnitude of these counteracting effects. Numerical simulations indicate that the positive price effect prevails at low levels of benefit morale, while the counteracting probability effect becomes stronger at higher benefit morale levels. In some cases, the negative probability effect overcompensates for the positive price effect at higher levels. The negative relationship between benefit morale and sick pay benefits is a sick pay specific result insofar as benefit morale affects marginally the incidence of sickness absence in a more direct way than the incidence of unemployment.

We test empirically the predictions of our theoretical model in a sample of 31 developed countries over the period 1981-2010. We measure the generosity of the entitlements as the mandatory gross replacement rate in the first week of illness for an individual earning an average production worker's wage. Benefit morale is measured by the World Values Survey and has been widely used in empirical research on welfare state programs (Heinemann, 2008; Halla and Schneider, forthcoming; Algan and Cahuc, 2009). Using a pooled cross-section design and spline regression functions to capture the non-linear relationship in a flexible way, we find evidence of a significant positive relationship in the lower half of the benefit morale distribution that is followed by a significant negative slope that flattens for very high values. These results are robust to measuring benefit morale and sick pay generosity in different ways. Overall, the data corroborates 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 offering evidence for benefit morale as a new explanation for cross-country diversity in sick pay entitlements. The concept underlying this paper is closely related to that proposed by Algan and Cahuc (2009), who argue that civic mindedness on the part of individuals allows moral hazard problems to be solved in the case of insurance against unemployment risks. We transfer Algan and Cahuc's idea to public welfare entitlement programs that cover the risk of losing one's work income due to illness. Countries that have generous unemployment benefits do not necessarily have generous sick pay entitlements so that a separate investigation of

the latter with respect to benefit morale is needed.[2] However, there are two fundamental differences: i) we present a political economy model while Algan and Cahuc (2009) offer a normative analysis; ii) they disregard the probability effect since benefit morale does not directly influence the probability of becoming unemployed in their model. In a very recent study, Algan et al. (2011) find with cross-country survey data that individual demand for general income redistribution is negatively influenced by the individual's trustworthiness and positively influenced by the share of trustworthy people in the population. However, our paper differs again in two ways: i) we investigate a *socially* shared norm that leads to a much more pronounced probability effet and, ii) we use real institutional outcomes instead of survey data on redistributive preferences. There are other socially shared beliefs that have an impact on public policies. Alesina et al. (2010) show, for instance, that more familiy values lead to more strictly regulated labor markets.

There are several studies that consider the long-run effects of welfare state generosity on work norms (Lindbeck, 1995; Lindbeck et al., 2003; Halla and Schneider, forthcoming; Heinemann, 2008; Halla et al., 2010); this paper, however, aims at investigating the opposite effect of social norms on institutions. We argue that welfare state institutions and social norms affect each other and, therefore, are *inter*dependent. However, there are particularly good reasons to investigate the link from social norms to public policy programs in detail, since individuals follow social norms in a rather uncritical way and acquire them involuntarily during their childhood, social norms adapt very slowly to changing conditions (Lindbeck, 1995; Postlewaite, 2011). 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-country diversity in sick pay entitlements and include more countries than in previous studies. There are to date two empirical studies on determinants of cross-country diversity in sick pay generosity. However, neither Korpi (1989) nor Allan and Scruggs (2004) take social norms into account as a possible explanation for cross-country diversity in sick pay insurance generosity. Furthermore, we add to the theoretical understanding of sick pay insurance by endogeneizing the insurance generosity in the sick pay and benefit morale framework used

[2]Sick pay and unemployment benefit generosity have a suprisingly small correlation coefficient of 0.27 in our sample.

by Lindbeck and Persson (forthcoming). Hence, we do not investigate the impact of benefit morale with respect to absence behavior as they do in their contribution but its impact with respect to the politically determined replacement rate for sick pay. We transfer the idea from Wright (1986) that voters' preferences for welfare benefits are driven by their probability of the insurance case. In contrast to our contribution, Wright (1986) offers a political economy model for unemployment benefits and does not take benefit morale into account. Hence, this paper is to our knowledge the first paper that combines positive theory, in the form of a political economy model with real institutional outcomes in the empirical investigation with regard to benefit morale as a determinant for welfare state generosity.
The remainder of this paper is organized as follows: Section 2 introduces our political economy model of sick pay generosity and furnishes numerical simulations for comparative statics. Section 3 describes the data and the econometric method used, and presents estimation results as well as some robustness checks. Section 4 concludes this study.

2 Theoretical Model

2.1 Description

The model is set up as follows. There are 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 ϕ while working. This shock can be interpreted as disutility from sickness due to work effort. Following Engström and Holmlund (2007) and Lindbeck and Persson (forthcoming), we model the sickness shock ϕ as a continous random variable, which leaves scope for benefit morale to play a role in absence decisions at the margin. Individuals are heterogenous in their exposure to this shock, which is drawn from probability distributions. In line with Lindbeck and Persson (forthcoming), individuals have to bear psychological or stigmatization costs when absent, $b \geq 0$. The level of the costs is associated with the stringency of the prevailing social norm in a society, such that b is constant within one society while varying between societies.
Following Engström and Holmlund (2007), we model a logarithmic consumption utility function. The utility of present and absent workers reads as follows: $u_p = \ln[w(1-t)] - \phi$ and $u_a = \ln[\rho w(1-t)] - b$. Present workers earn an exogenously determined wage w and have

to pay taxes t that finance the sick pay benefits.[3] Absent workers are entitled to sick pay benefits with a replacement rate of ρ, $0 < \rho \leq 1$. For simplicity, we assume that benefits are taxed at the same rate as regular wage income.
Since the individual health status is private information, individuals self-select into the two labor force states by comparing disutility from work against reduced consumption and psychological costs at home. Accordingly, employees hit by a shock which is higher (lower) than the reservation value, s, stay at home (go to work):

$$s = b - \ln \rho. \tag{1}$$

Here, the psychological costs b guarantee that individuals in a context with higher benefit morale are less likely to be absent (Ichino and Maggi, 2000; Lindbeck and Persson, forthcoming). Each individual is aware of his or her exogenous exposure to the sickness shock, i.e., the probability distribution of ϕ, which is private information. The aggregate shock in the population is a random variable drawn from a publicly known distribution $F(\gamma)$ with support $\left[\underline{\gamma}, \overline{\gamma}\right]$ and density $f(\gamma)$. As the size of the population equals unity, we can interpret $F(s)$ as the share of the population that works, while $[1 - F(s)]$ of the population stays at home. With this information and assuming that we exclude cross financing of other programs, we can write the budget equation as:

$$t = \frac{[1 - F(s)]\,\rho}{F(s) + \rho\,[1 - F(s)]}. \tag{2}$$

2.2 Political Economy Model

The population decides on the generosity of the sick pay insurance, ρ, in an election with a simple majority vote before the realization of the sickness shock. Due to a binding budget constraint, replacement rates and tax rates are chosen simultaneously. Thus, the vote simplifies to a single-issue ballot on the replacement rate. The concavity of the utility function guarantees single peaked preferences, which allows the median voter theorem to be applied.

[3]The economic mechanism at stake here is not dependent on the assumption that sick pay is financed by a 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 to lower equilibrium wages via reduced output. Hence, we have an effect similar to the price effect in the tax-financed model. As we take only budgetary costs into account in our model and disregard the output effect, we are at the lower level of effects brought about by norm-guided absence behavior.

As the individuals are heterogenous with regard to sickness risk, the individual with the median exposure to illness has the decisive vote. In order to allow the median's shock to differ from the shock in the overall population, we let $G(\phi)$ represent the cumulated distribution of the utility shock ϕ for the pivotal voter with density $g(\phi)$.[4] Substituting the tax rate t as in (2), expected utility of the median voter reads as follows:

$$EU_{median} = \int_{\underline{\phi}}^{s} (\ln \left[\frac{F(s)w}{F(s) + \rho \left[1 - F(s)\right]} \right] - \phi) \, dG(\phi) + \int_{s}^{\bar{\phi}} (\ln \left[\frac{\rho F(s)w}{F(s) + \rho \left[1 - F(s)\right]} \right] - b) \, dG(\phi). \tag{3}$$

Due to the self-selection mechanism in equation (1), a higher replacement rate encourages more people to stay at home as the reservation value s decreases. The share of absent workers has, in turn, repercussions for the insurance terms, as it influences the benefits-to-tax ratio via the budget constraint, i.e., the "price" for any given level of ρ increases. This moral hazard effect caused by the insurance has to be taken into account by the pivotal voter when choosing the optimal replacement rate. Thus, the voter chooses ρ to maximize his or her expected utility subject to the incentive compatibility constraint (1) that takes the moral hazard effect into account. Assuming there is a maximum, it can be characterized by two optimality conditions[5]:

$$h(s, \rho) = \left[1 - G(s)\right] F(s) - G(s) \left[1 - F(s)\right] \rho - \frac{\rho f(s)}{F(s)} \equiv 0 \tag{4}$$

$$s(\rho, b) = b - ln(\rho). \tag{5}$$

The first optimality condition (4) takes direct and indirect effects of a changed replacement rate on the expected utility of the pivotal voter into account. The first two terms of $h(s, \rho)$ represent the standard insurance trade-off between more consumption when absent at probablity $[1 - G(s)]$ and less consumption when present at probability $G(s)$. An increase in ρ 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

[4] 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.

[5] The sign of the bordered Hesse Matrix, $\left|\bar{H}_2\right|$, 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 $\left|\bar{H}_2\right| > 0$ holds for relevant parameter constellations. We thus assume the second-order condition to be fulfilled.

second condition (5) represents the incentive compatibility condition.

2.3 Comparative Statics

We will now 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 ρ^*, i.e., the generosity of the sick pay entitlements. According to the implicit function theorem, changes in ρ induced by exogenous changes in b can be written as:

$$\frac{\partial \rho^*}{\partial b} = -\frac{\frac{\partial h}{\partial b} + \frac{\partial h}{\partial s^*}\frac{\partial s^*}{\partial b}}{\frac{\partial h}{\partial \rho} + \frac{\partial h}{\partial s^*}\frac{\partial s^*}{\partial \rho}}. \tag{6}$$

From the second-order condition we can deduce a negative denominator. Since $\frac{\partial h}{\partial b} = 0$ and $\frac{\partial s^*}{\partial b} = 1$, the direction of the total effect hinges on the partial derivative $\frac{\partial h}{\partial s^*}$:

$$\begin{aligned}\frac{\partial h}{\partial s^*} =& -g(s^*)\{F(s^*) + [1 - F(s^*)]\,\rho\} + f(s^*)\{[1 - G(s^*)] + G(s^*)\rho\} \\ & - \frac{\rho f'(s^*)}{F(s^*)} + \frac{\rho\,[f(s^*)]^2}{[F(s^*)]^2} \gtrless 0.\end{aligned} \tag{7}$$

Analytically, it is not clear which of the counteracting effects in $\frac{\partial h}{\partial s^*}$ prevails. The first term in (7) represents the effects of an increase in the probability of the pivotal voter being present and working due to a marginal increase in s^* (probability effect). This effect reduces the utility gains from increased insurance, since this effect makes the voter more likely to be a net contributor to the insurance. The second term takes changes in the working behavior of the whole population into account. Since more people go to work instead of staying at home, each unit of insurance is less costly to the voter (price effect) which favors more insurance. Assuming $f'(s^*) \leq 0$ in the relevant range for s,[6] the third term represents the reduction of the negative moral hazard effect in the optimality condition $h(s, \rho)$, as weakly fewer people are marginally affected by increases in ρ when moving to higher values of s. Finally, the last term shows, that if more people go to work, the moral hazard costs of an increase in generosity are shared among more people working, which makes this increase in generosity cheaper for the median voter. Hence, the direction of the overall effect of a change in benefit

[6]This assumption implies that the probability of a stronger shock occuring is not higher than the probability of a smaller shock or that more severe diseases are less prevalent, which seems plausible.

morale on sick pay generosity depends on whether the negative probability effect is stronger in size than the combined positive effects that are brought about as more people work and the moral hazard effect is marginally reduced.

In the case of a positive partial derivative $\frac{\partial h}{\partial s^*}$ equation (6) establishes a positive connection between benefit morale and the equilibrium replacement rate. Here, the price sinks sufficiently due to stricter benefit morale that more insurance increases the median's utility albeit his or her reduced absence probability. In the other case, i.e., $\frac{\partial h}{\partial s^*} < 0$, the overall effect is negative. Here, the median's incidence of sickness absence is reduced by stricter benefit morale to the point that—even though the price is reduced—less generous insurance leads to utility gains for the median voter.

If the median has the same shock pattern as the whole population (welfare maximization), the overall effect is ambiguous except for the unplausible case that $F(s^*) < 1/2$.[7] To shed light on this analytically indeterminate problem, we run numerical simulations.

Using numerical simulations, we analyze several parameter constellations, vary the expected scope and the spread of the shock's distribution and assume different types of distribution for the sickness shock (the results are available upon request). The relationship between benefit morale level and replacement rate is concave in all these models. While the positive price effect prevails at low levels of benefit morale, the counteracting probability effect becomes stronger at higher benefit morale levels. In some cases, the negative probability effect overcompensates for the positive price effect at higher levels, which leads to a hump shaped pattern. With regard to the resulting absence rate, we replicate the negative impact of benefit morale presented in Lindbeck and Persson (forthcoming) for all parameter constellations. This direct impact of benefit morale on the incidence of the insurance case distinguishes our model from the model in Algan and Cahuc (2009) covering unemployment benefits. We conclude from the simulation that the pattern between benefit morale and the replacement rate is characterized by a positive relationship at low levels that might turn negative for higher levels of benefit morale. In the following section, we empirically analyze the determinants of sick pay entitlements, with benefit morale as an additional explanation not present in the previous literature.

[7] In this case equation (7) simplifies to $\frac{\partial h}{\partial s^*} = f(s^*)\left[1-\rho\right]\left[1-2F(s^*)\right] - \frac{\rho f'(s^*)}{F(s^*)} + \frac{\rho[f(s^*)]^2}{[F(s^*)]^2}$. $F(s^*) < 1/2$ and $f'(s^*) \leq 0$, guarantee that equation (7) is positive, which produces an overall positive effect. However, under the more plausible assumption $F(s^*) > 1/2$, which implies that more than half of the population is present, the overall effect is again ambigous.

3 Empirical Evidence

3.1 Data

Our data set covers 31 developed countries between 1981 and 2010.[8] Our dependent variable is the statutory gross replacement rate in the first week of illness for a single household earning an average production worker's wage. We disregard privately concluded sick pay benefits as part of work contracts or collective bargaining agreements due to a lack of data. In addition, 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 3). The gross replacement rate has a major advantage over the net replacement rate: namely, that it is independent of tax policy reforms. Since we assume that benefit fraud takes place in short spells of absence, we measure the generosity of sick pay during the first week of illness, and we take waiting days into account. As a robustness check, we present results with sick pay measured as a replacement rate that does not take waiting days into account.

The data on sick pay entitlements is taken from three different sources in order to obtain a number of observations as large as possible. For the 1980s and 1990s, we use the Social Citizenship Indicator Program data set (SCIP) provided by the Swedish Institute for Social Research (SOFI), which covers 18 major developed countries from 1930 to 1995 (Korpi and Palme, 2007). For the years after 2000, we expand our sample to the major EU-27 countries by using the EU's Mutual Information System on Social Protection (European Union, 2012), and for countries that are not members of the European Union, we use the Social Security Programs Throughout the World Series (US Social Security Administration and International Social Security Association, 2010).[9] Generally, there is much more variation between countries than there is variation over time. The replacement rates range from zero in the first week in some anglophone countries to 100% of the wage in some Central and North European countries. The bulk of the countries however, guarantee a gross replacement rate

[8]These countries are: Australia, Austria, Belgium, Bulgaria, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

[9]To guarantee the most accurate and consistent data possible, we cross-checked the values between the different sources, where feasible, 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.

in the first week strictly between zero and one. Country averages of the sick pay data are in Table 2 in the appendix.

The variable of interest, benefit morale, is taken from the European and World Values Survey (European Values Study and World Value Survey Association, 2009) waves one to five, which has been widely used in empirical research on social norms and the welfare state (Algan and Cahuc, 2009; Halla and Schneider, forthcoming; Heinemann, 2008). The World Values Survey (WVS) is a survey of attitudes on a worldwide base, which provides over 500 representative observations per country for our sample. 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?"[10] The scale ranges from one for "Never justifiable" to 10 for "Always justifiable". We disregard wave three due to a lack of sick pay data and, hence, 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).[11] We work with waves as time units and take country averages over the duration of each wave for the annually measured controls. Since the institutional data from the last century is only available in five-year periods and the WVS is polled aperiodically, 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.[12] As the World Values Survey does not cover the benefit morale item in all countries in each wave, we have an unbalanced panel covering 31 countries in four waves over the period 1981-2010.

We follow Algan and Cahuc (2009) in taking shares of individuals who have answered "Never justifiable" within each country as a measure of a country's benefit morale. The country average ranges from less then a quarter in Greece to around 90 percent in Denmark. With a gradual decline of about nine percent over the past 30 years, benefit morale can still be described as relatively stable over time. This fits our contention that benefit morale is a social norm, which is to a great extent internalized and transmitted from one generation to the next. Only in Finland do we observe one discordant value: the share of participants answering "Never justifiable" dropped in Finland from almost two thirds in the first wave

[10] The item does not ask for the socially shared but the individual norm. Hence, it can be rather interpreted as the internalized part of the social norm. However, the aggregate country measures give a good idea of how much benefit morale is shared among the population.

[11] The sick pay data from SCIP ends in 1995 and MISSOC starts in 2004.

[12] Accordingly, benefit morale and lagged controls from 1981-82 are associated with the replacement rate in 1985, 1989-90 norms with institutions in 1995, 1999-2000 with 2004 and finally 2004-08, with entitlements in 2010.

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.[13] Thus, this observation is an outlier, in the strict sense of the term, and we disregard it in our subsequent investigation.[14]

We will now turn to the control variables. First, there are political factors drawn from the literature on comparative welfare state institutions that are deemed to affect public sick pay programs (Korpi, 1989; Allan and Scruggs, 2004). The political orientation of the government is measured by the government partisanship index, taken from the Comparative Political Data Sets 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. Furthermore, we take a communist past of a country into account. In addition to the political dimension, economic factors shape institutional choice. Economic problems might force governments to reform welfare programs, and for that reason, our model contains real GDP growth as a proxy for economic shocks. Moreover, in order to account for the absolute level of wealth in a country, we include GDP per capita measured in 2005 US dollars. In addition, welfare program generosity has been linked to economic openness which is measured as the ratio between the sum of imports and exports and a country's GDP, since these programs are seen as a means to reduce external risk from exposure to the world market (Rodrik, 1998). The economic controls are taken from IMF sources and the Penn World Tables. Finally, since Ichino and Riphahn (2005) have shown that employment protection reduces the incidence and the duration of sick spells, we include the Employment Protection Legislation Indicator (EPL) from the OECD (Version 1) that is supplemented with data for middle and eastern European countries from the literature.[15] Summary statistics are in Table 1 in the appendix.

[13] Finland's situation in 1990 was characterized by a huge economic downturn accompanied by the disintegration of the Soviet Union, Finland's neighbor and biggest trading partner.

[14] Our results are sensitive 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.

[15] Detailed information about the concept and measurement of the EPL indicator can be found in OECD, ed (1999). We choose the OECD Version 1 indicator since this measure is available for the longest time span, i.e., since 1985. For that reason, EPL is measured in the first wave in 1985 only. For supplementary data, we consult primary sources that apply the OECD methodology, i.e. Muravyev (2010) for the Baltic countries and Tonin (2009) for Bulgaria, and Romania. The results are not sensible to the inclusion of these additional data (regression results are available upon request).

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. Despite the limited range of the dependent variable, an OLS model is selected over a tobit model, in order to avoid the stricter distributional assumptions inherent in the latter, which is presented in the next section as a robustness check. We abstain for two reasons from the inclusion of country dummies. First, this allows us to retain the dominant cross-country variation of sick pay in the model. Second, by doing so we can keep twelve countries in our analysis for which data is available only in the cross-sectional dimension.
Since the literature postulates a negative long-term impact of welfare state benefits on work norms, i.e., in the inverse direction, there is quite likely a reversed causality problem leading to a simultaneity bias (Lindbeck, 1995; Lindbeck et al., 2003; Halla and Schneider, forthcoming; Heinemann, 2008). However, due to the very temporary character and rather small amount paid by sick pay programs compared to other welfare programs, we seriously doubt that sick pay generosity has a strong and persistent bearing on the benefit morale level prevalent in a country. Unemployment benefits seem to be much better suited to have an impact on work norms due to higher amounts spent and longer duration of payments. The idea that the generosity of sick pay reflects the generosity of unemployment benefits finds little support in our data, which calculated a correlation coefficient of 0.27 between the replacement rate for unemployment and sickness.[16] Hence, countries with generous sick pay entitlements do not necessarily have generous unemployment benefits, which in turn are expected to affect the benefit morale level in the long run. Also problematic is the fact that our data covers almost 30 years, which increases the likelihood that social norms adapt to institutions. The gradual decline of benefit morale observed in our data of about six percentage points or nine percent could lead—if caused by generous sick pay entitlements—to a simultaneity bias. We can calculate the direction of this simultaneity bias, i.e. the asymptotic covariance between benefit morale and the error term, under some assumptions only.[17] With a claimed negative impact from generosity on benefit morale, according to the literature, benefit morale should under these assumptions be negatively correlated with the error term in our model and lead

[16]The gross unemployment benefit rate for an average production worker is taken from van Vliet and Caminada (2012).

[17]The sign of the bias can only be calculated when we (i) disregard covariates in the two structural equations (benefit morale on welfare benefits and welfare benefits on benefit morale), (ii) assume that the error terms of the two structural equations are uncorrelated, and (iii) the product of the two structural coefficients is less than one, c.f. Wooldridge (2006, pp. 550-551).

to a downward bias of the coefficient of interest. However, these considerations should be taken with some caution due to the restrictive underlying assumptions. Additionally, as political processes work slowly, independent variables are generally lagged, which also helps to mitigate the reversed causality problem.

To capture the predicted concave pattern that might decrease at higher levels in a flexible way, we use socalled spline regressions (Greene, 2003, pp. 121-122). Spline regressions or piecewise linear regressions allow for different linear slopes in sections of the benefit morale range. We prefer spline regression models to quadratic regression models for their flexibility, but we will present the latter as a robustness test in the following section. We decide whether and where to put the knots of the spline regression, i.e., the kink points, by means of Wald tests of nested models. Hence, we test in which benefit morale range a different slope would add most to the fit of the model. The first knot is best at a benefit morale level of 0.56 with a p-value of 0.01 in the Wald test of nested models. Given this, the second knot is best at 0.72 with a p-value of 0.05. Hence we estimate different linear effects in these three value ranges.[18] Taken together, we analyze the correlation between benefit morale and sick pay insititutions by estimating the following model:

$$RR_{c,t} = \gamma_1 + \beta_1 BM_{c,t-1} + \beta_2 BM2_{c,t-1} + \beta_3 BM3_{c,t-1} + \gamma_2 \mathbf{X}_{c,t-1} + \gamma_3 wave_t + \epsilon_{c,t}. \quad (8)$$

In this equation, $RR_{c,t}$ represents the gross effective replacement rate for a single person in country c, at date t; $BM_{c,t-1}$ denotes the benefit morale in country c, at date $t-1$; $BM2_{c,t-1}$ represents the second linear effect starting at a benefit morale level of 0.56; $BM3_{c,t-1}$ represents the third linear effect starting at 0.72 of benefit morale. Finally, the vector $\mathbf{X}_{c,t-1}$ includes lagged control variables; $wave_t$ represents time fixed effects; and $\epsilon_{c,t}$ is an error term. In order to guarantee consistent standard error estimates, we use heteroskedasticity-robust standard errors that take clustering by country into account.[19] The regression results are in Table 3.

[18] These data generated ranges happen to cut the relevant value range, 0.24-0.90, into the lower half and split the remaining upper half into two almost equally sized sections. Hence we have (i) a first range with observations between benefit morale levels of 0.24 and 0.56; (ii) a smaller middle range between 0.56 and 0.72 and finally (iii) the upper range with observations between 0.72 and 0.90. The lower part contains one quarter of the observations, the middle range 45% and the upper range 30 %.

[19] Since it could be argued that the cluster adjustement with only 31 countries is biased, we also estimate Huber-White standard errors which does not change the significance of the results (results are available upon request).

[Insert Table 3 about here]

Looking at the baseline specification (1) in Table 3, we find a positive and highly significant coefficient for the general benefit morale variable (β_1), a negative and significant coefficient for the second linear effect starting at 0.56 (β_2) and finally a positive but less significant coefficient for the third linear effect starting at 0.72 (β_3). In the lower section, we obtain a highly significant positive relationship. Combining β_1 and β_2 in the middle section we find a significant negative slope while the combined effect in the third section is positive but insignificant. This fits with the results of our theoretical model and its numerical simulations that point to a hump shaped pattern indicating a dominant price effect at lower levels of benefit morale, while at higher levels, this positive effect is outweight by the negative probability effect. Hence, higher levels of benefit morale are associated with an increase in generosity in the lower half of benefit morale, a decrease in the middle, and no effect in the upper range. The effects are economically sizeable. Hence, in the lower half of benefit morale an increase of one standard deviation of benefit morale in this subsection (0.09) is associated with an increase of about 19 percentage points in sick pay generosity. Due to the negative simultaneity bias, we should consider the negative slope more cautiously, but taken at face value a change in benefit morale of one standard deviation in the middle range (0.04) comes with a reduction of six percentage points of generosity.

Concerning the controls, we find that openness, higher GDP per capita, stricter EPL and a communist past are significantly positivly associated with generous sick pay entitlements. In contrast with the literature, we do not find any effect of the cabinet composition, which might be due to the weakened polarization between left and right in many countries.

3.3 Robustness checks

As a robustness check, we use differently measured variables for sick pay generosity and benefit morale in models (2) and (3), respectively. Specifically, we calculate the replacement rate by using the benefits paid after waiting days have elapsed, which does not fundamentally change our results (model 2). By constructing a broader defined benefit morale measure, we try to address the potential of an extreme response bias in the WVS which leaves our results basically unaffected (model 3).[20] Given the structure of our data with the limited range of

[20]In some cultures, people are reluctant to choose extreme values in surveys (Johnson et al., 2005). For that reason, we take the country share of individuals choosing the two most negative options of the benefit morale item and apply the spline model with the knots guaranteeing the best fit, here, at 0.74 and 0.82.

the dependent variable between zero and one, a tobit model can be considered, but this does not fundamentlly change our results (model 4). Finally we present a quadratic regression model to make sure that the results are not only driven by the choosen spline regression models. Again, the Wald test of nested models calls for the inclusion of the quadratic term (p-value of 0.05) leading to a hump shaped pattern with a turning point at a benefit morale level of 0.63. Hence this model approves that the positive price effect prevails at lower levels and is compensated for by the negative probability effect at higher levels of benefit morale. Note that a quadratic model can either be U-shaped or hump-shaped, which means that the slope is large in size and, hence, is significant only at high and low levels. In contrast, the spline model is more flexible with regard to the direction of the slope. For this reason we prefer the spline model to the quadratic model despite its limitation to constant slopes inside each benefit morale range.

In order to see whether the results are driven by single countries, we rerun the baseline model excluding one country at a time, which does not alter our results fundamentally (not shown). The results are generally robust to the exclusion of single waves with two exceptions: When dropping wave 1, the positive combined effect in the highest range becomes significant, whereas without wave 4 the negative middle range becomes insignificant. Unchanged point estimates with increased standard errors suggest that this result is caused by the reduced number of observations.

4 Conclusion

This paper proposes benefit morale as an additional explanation for cross-country diversity in public sick pay generosity. In particular, we analyze the impact of benefit morale on sick pay generosity in a political economy model and present empirical evidence for 31 countries between 1981 and 2010. Since benefit morale is predicted to reduce absence behavior, it affects the sick pay replacment rate in two ways. On the one hand, less absence reduces insurance costs as fewer people claim benefits which favors, ceteris paribus, increased generosity due to lower prices (price effect). On the other hand, being less frequently absent makes a generous insurance less desirable for voters (probability effect). Numerical simulations suggest that the positive price effect prevails at low levels of benefit morale, while the counteracting probability effect becomes stronger at higher benefit morale levels. In some cases, the negative probability effect overcompensates for the positive price effect. We find

empirical evidence for the positive price effect in the lower benefit morale range, for the negative probability effect in the medium range flattening for high values. Due to a potential negative simultaneity bias, the negative effect should be considered cautiously.
The existence of the positive effect is already covered in the literature for other welfare state dimensions, while the negative probability effect in this dimension is a new finding. The negative relation is mostly due to the fact that higher benefit morale reduces the incidence of the insurance case by making absence rather unattractive for the employed individuals through additional psychological costs. In extremum, reduced absence behavior leads to presenteeism meaning that people go to work sick, which negatively affects overall productivity. In this sense, generous entitlements could be a means to counterbalance too strict benefit morale standards in some countries in order to prevent presenteeism. The combination of benefit morale and presenteeism could be an interesting subject for further research. Furthermore, the negative effect could be taken as argument to see benefit morale not only as a social precondition for sick pay entitlements but also as its subsitute. The same argument could also apply—to a lesser degree—to other welfare programs, for instance, to disability insurance.

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5 Appendix

Table 1: Summary statistics

Variables	Mean	Standard deviation (overall)	(between)	(within)	Min.	Max.
Sick pay generosity (gross replacement rate)	.51	.36	.35	.03	0	1
Sick pay generosity (after waiting days)	.63	.29	.28	.03	0	1
Benefit morale (population share)	.64	.13	.14	.05	.24	.90
Benefit morale (broader definition)	.75	.12	.13	.03	.38	.92
Govern. partisanship (Schmidt Indicator)	2.49	1.36	1.06	.93	1	5
Empl. Prot. Legisl. (OECD Version 1)	1.96	.95	.84	.3	0.21	3.67
GDP per capita (th 2005 US $)	25.866	8.515	8.685	4.787	7.995	49.236
Real GDP growth (percentage change)	3.13	1.93	1.70	1.33	-1.13	9.85
Trade openness (share of GDP)	.75	.36	.36	.09	.19	1.74

Each variable has 72 observations from 31 countries.

Table 2: Sickpay generosity data (country averages)
with waiting days and after waiting days

US: 0; 0. AUS: 0; 0.28. CAN: 0; 0.55. NZ: 0; 0.21. UK: 0.13; 0.23. IRL: 0.14; 0.25. GRE: 0.22; 0.39. IT: 0.29; 0.5. FR: 0.29; 0.5. POR: 0.31; 0.55. ESP: 0.34; 0.6. JPN: 0.37; 0.62. Slovakia: 0.42; 0.42. CZ: 0.43; 0.43. DK: 0.56; 0.59. NL: 0.61; 0.71. LTV: 0.67; 0.91. EST: 0.69; 0.8. SWE: 0.69; 0.81. ROM: 0.75; 0.75. BUL: 0.76; 0.76. HUN: 0.8; 0.8. POL: 0.8; 0.8. LIT: 0.84; 0.84. Slovenia: 0.9; 0.9. BEL: 0.95; 1. AUT: 1; 1. FIN: 1; 1. GER: 1; 1. NOR: 1; 1. CH: 1; 1.

Table 3: Sick pay generosity regression results

	(1) (OLS)	(2) (OLS)	(3)[1] (OLS)	(4) (tobit)	(5) (OLS)
Benefit morale β_1	2.14***	1.77***	1.77***	2.87***	4.56**
	(0.67)	(0.50)	(0.50)	(0.95)	(2.07)
Second range (0.56-1) β_2	-3.95***	-3.22***	-5.27***	-5.5***	
	(1.29)	(0.92)	(1.50)	(1.87)	
Third range (0.72-1) β_3	2.84*	1.62	5.15**	3.43*	
	(1.44)	(1.11)	(2.22)	(1.93)	
Cabinet composition	0.01	-0.01	0.02	0.02	0.01
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Trade openness	0.31***	0.25**	0.31***	0.48***	0.31**
	(0.10)	(0.12)	(0.11)	(0.17)	(0.12)
GDP per capita	0.02***	0.02*	0.02***	0.03*	0.02***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Real GDP growth	0.00	-0.00	0.01	-0.00	0.00
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Communist past	0.59***	0.35*	0.64***	0.62**	0.63***
	(0.19)	(0.19)	(0.18)	(0.29)	(0.19)
EPL (Version 1)	0.18***	0.18***	0.20***	0.25***	0.22***
	(0.05)	(0.05)	(0.05)	(0.08)	(0.05)
Benefit morale squared					-3.6**
					(1.7)
Wave dummies	Yes	Yes	Yes	Yes	Yes
Combined linear effects					
First range	2.14***	1.77***	1.77***		
Second range	-1.81**	-1.45***	-3.50***		
Third range	1.03	0.18	1.65		
Joint sign. of benefit morale	0.01	0.01	0.01	0.01	0.08
N	72	72	72	72	72
n	31	31	31	31	31
R^2 / Pseudo-R^2	0.56	0.56	0.57	0.40	0.52

Heteroskedasticity-robust standard errors, clustered by country, in parentheses.
Constant not shown. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

[1] In column (3) the benefit morale variables are measured in the broader definition and with accordingly changed ranges. Second range: 0.74-1; Third range: 0.82-1.

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