Privatisation of sickness insurance: Evidence from the Netherlands

Philip de Jong and Maarten Lindeboom[*]

Summary

■ Since 1996, the Dutch Civil Code mandates employers to continue to pay 70 per cent of earnings during sickness. This puts the employer in the role of the insurer of sick pay. By confronting firms with the full cost of sickness absenteeism, they get a strong incentive to reduce it. But since about 80 per cent of all firms (mostly small ones) reinsure their sick pay liability with a private insurance company, moral hazard may diminish this incentive. We use longitudinal firm-level data to assess the effect of the choice of insurance status and preventive and reintegrative measures on firm-level absence rates. Using a fixed-effect regression model, we show that the impact of a firm's choice of insurance status on the sick rate is not significant. Hence, in this case, insurance does not lead to adverse, moral hazard, effects.■

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Privatisation of sickness insurance: Evidence from the Netherlands

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Dutch employees are entitled to a benefit that, in almost all cases, fully replaces their net wage. Since 1996, the Civil Code mandates employers to continue to pay 70 per cent of the earnings during sickness. This puts the employer in the role of the insurer of sick pay. By confronting firms with the full cost of sickness absenteeism, they get a strong incentive to reduce it. About 80 per cent of all firms (mostly small ones) have their sick pay liability reinsured by a private insurance company.

In this paper, we look at some aspects of this privatisation. We first describe Dutch institutions and look at aggregate time-series to see whether we can find any effect of the change in the Dutch system on absence rates. Our main finding is that, after controlling for the business cycle, the absence rates have been substantially reduced. With macro-data it is, however, difficult to understand how this reduction in absence rates was reached. In the second part, we use firm-level data to look more thoroughly at two factors that are of relevance for the firm absence rates: the firm's decision to (re)insure their sick pay risk and the decision of the firm to use preventive and reintegration measures to reduce absence rates.

Uninsured firms bear the absence risk on their own, whereas insured firms transfer at least some part of the absence risk to the insurance company. The role of the insurance company will be to discipline the firm to reduce moral hazard. One way of doing this is to demand that firms use preventive and reintegration measures to control their absence rates. It will therefore be relevant to assess the effect of insurance status and preventive and reintegration measures on firm absence rates. This is not straightforward because of the interrelation between these variables. Insurance status and preventive and

reintegration measures may affect absence rates and vice versa, and there may be unobserved firm-specific factors (e.g. management style) that influence absence rates and the insurance status and preventive and reintegration measures. Our analyses will take this simultaneity problem into account.

Unfortunately, our firm-level data do not allow us to assess the overall effect of the privatisation on Dutch absence rates. The first wave of our data was held in 1996, the year when the privatisation started. Our choice is to focus on the effects of insurance status and preventive and reintegration measures. These variables are relevant from a policy point of view. They also serve practical (identification) purposes.

1. The Dutch sickness and disability benefit schemes

1.1. Sickness benefits

When a Dutch worker is unable to perform his or her job because of illness or injury, irrespective of its cause, he or she is entitled to sick pay. Sick pay should replace at least 70 per cent of the gross wage earnings but all collective bargaining agreements between employers and employees stipulate that sickness benefits be supplemented, and for 90 per cent of Dutch employees, the effective after tax replacement rate is 100 per cent. Sick pay ends after 12 months.

In March 1996, the Sickness Benefit Act was abolished. Under this Act, sick pay was collectively financed through sector-specific insurance funds, administrated by public agencies. By abolishing this Act, employers became responsible for the coverage of sick pay during the first 12 months of sickness, after which the Disability Insurance takes over. Under the Civil Code, firms are obliged to continue to pay 70 per cent of the gross earnings during sickness but, in practice, after the inclusion of collectively bargained supplements, this means continuation of the net wage. Hence, employers are fully confronted with their sickness benefit risks.

Under the preceding Sickness Benefit Act, employers were obliged to continue the wage payment during the first six weeks of sickness.[1]

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[1] Firms with a wage bill smaller than 16 times the average wage had a coinsurance period of two weeks.

This short coinsurance period was introduced in 1994. Before 1994, all payments of sickness benefits were covered by sectoral funds.

Since 1996, firms are legally mandated to contract with a private occupational health agency and buy a package of services including sickness prevention and management of sickness claims. These agencies employ physicians specialised in occupational medicine to check the legitimacy of sick reports. Firms can choose freely whether they want to bear their sick pay risks themselves or have (part of) them covered by a private insurer.[2]

These new mandates and responsibilities aim at reducing absenteeism and inflow into the disability benefit programme by confronting firms with the full cost of the health risks they are presumed to induce. This presumption is based on the idea that, even if a firm is not responsible for the cause of an employee's sick leave, it can always influence its duration. In this privatised context, investment in prevention and reduction of sickness is profitable because it reduces avoidable costs of absenteeism.

A residual Sickness Benefit fund covers those workers that are legally insured but:

- for whom the employer cannot reasonably be charged with continuing wage payment during sickness. These are: employees during pregnancy and maternity leave, employees on a temporary contract or other forms of flexible contracts and those hired through a temporary work agency;

- who do not have an employer. The main group here is dismissed workers who get unemployment insurance benefits; and

- who have a recognised status as work handicapped.[3] Covering handicapped workers collectively removes the barriers to re-

[2] Small firms may be unable to offer a commensurate job if an employee is afflicted by a disability that prevents him from doing his old job. In that case, a reintegration service organisation should mediate towards placement in a new firm. As of 2003, employers are obliged to subscribe to the services of a private reintegration organisation to help disabled employees for whom no commensurate work is available within the firm.

[3] Work handicapped persons are all those meeting one or more of the following qualifications: having a disability that reduces one's productive capacity; being entitled to a disability benefit, or having lost one's entitlement less than five years ago; being entitled to an in-kind provision or subsidy to maintain or restore one's productivity, or having lost one's entitlement to such a provision less than five years ago; belonging to the group targeted by the Sheltered Work Provision Act; not be-

employment they would otherwise face. Given their sick pay responsibilities, employers are likely to discriminate against seemingly unhealthy workers. For that same reason, an Act banning medical examinations as part of an application procedure was introduced in 1998.

1.2. Disability benefits

Under the Dutch ruling, any illness or injury may entitle an insured person to a disability benefit after a mandatory waiting period of 12 months (covered by the sick pay scheme described above). While other OECD countries make a distinction in whether the impairment occurred on the job or elsewhere, only the *consequence* of impairment is relevant for the Dutch disability insurance programme.

The degree of disablement is assessed by considering the disabled worker's residual earning capacity. This capacity is defined by the earnings flowing from any job commensurate with her residual capabilities as a percentage of the pre-disability earnings. The degree of disablement is the complement of residual earning capacity and defines the benefit level. The Disability Insurance programme distinguishes between seven disability classes. The minimum loss of earning capacity entitling to a benefit is 15 per cent. Replacement rates range from 14 per cent of covered earnings in the 15 to 25 per cent disablement category to 70 per cent in the 80 to 100 per cent category. Disability benefits are terminated at the pension age of 65.

Partial benefits can be combined with labour earnings up to the level of the pre-disability wage. If recipients of a partial benefit are unable to find gainful employment, they are entitled to a partial unemployment benefit. Combinations of disability and unemployment benefits can, however, never replace more than 70 per cent of the earnings lost.

Disability benefits are based on age and earnings. The benefit period is cut into two, chronologically linked, parts. The first is a short-term wage-related benefit replacing 70 per cent of before-tax earnings. The duration of this wage-related benefit depends on the age at the onset of disablement. It varies from zero for those aged below 33 to six years for those whose disability started at the age 58 or beyond.

longing to any of the before-mentioned groups but having been assessed (through medical examination at a social insurance agency) as work handicapped.

Hence, workers aged 58 and older keep their 70 per cent replacement rate until the statutory pension age, 65.

The second part is a so-called follow-up benefit with a lower income base and, hence, a lower replacement rate with respect to the pre-disability wage. During the follow-up period, the income base for benefit calculation is the minimum wage *plus* a supplement depending on the age at the onset of disability according to the formula:

2 per cent * [age at onset—15]*[wage—minimum wage].[4]

Age serves as a proxy for work history, or "insurance years", introducing a quasi-pension element into the disability system. Most collective bargaining agreements cover the gap between the lower replacement rates in the follow-up period and the 70 per cent replacement rate during the first period of disablement. The effective replacement rate when fully disabled, therefore, remains at 70 per cent in most cases. Still, going from sickness onto disability benefits means a 30 per cent loss of (before tax) income.

Disability benefits are capped at an earnings base of EUR 43,000 per annum (in 2003). This is also the maximum amount of income taxable for disability (and unemployment) insurance.

The Disability Insurance scheme is administered by an autonomous public body (UWV, Social Insurance Institute). It operates under a contract with the Ministry of Social Affairs. The Social Insurance Institute employs teams of social insurance doctors and vocational experts to assess disability benefit claims. The doctors make an inventory of the functional limitations of a claimant and the vocational experts check the labour market to find jobs that are commensurate with those limitations. Only the existence of such jobs is relevant, not their status or availability.

Since 1998, experience rating of firms is gradually phased into the disability insurance scheme. Pre-1998 benefits are still funded by the existing uniform pay-as-you-go contribution rates, but as of 1998, the first five years of disability benefit recipiency of new beneficiaries are paid out of premiums that are levied according to the "polluter pays principle". If an employee is awarded a disability benefit, the firm will

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[4] A worker who is assessed to be fully disabled at 45 and earns twice the minimum wage (=2 x EUR 16,000) is entitled to 70 per cent of (1 + 0.02 x 30) x 16,000 = EUR 25,600. This is almost EUR 18,000, implying a replacement rate of 56 per cent.

face a higher contribution rate, and vice versa if a firm employs a disability beneficiary.[5]

1.3. Summing up the incentives

All in all, employers are those hit hardest by the changes enacted from 1994 onwards. First, they are legally obliged to continue the payment of wages of sick employees for the first year of sickness. Second, if an employee is thereupon awarded a disability benefit, the firm will pay a higher disability insurance contribution rate. Third, all firms are mandated to contract an occupational health agency to prevent and manage sickness absenteeism. And, fourth, employers are responsible for the work resumption ('reintegration') of long-term sick listed workers.

The incentives for employees are much weaker. The effective replacement rate during sickness is, in most cases, 100 per cent of the net earnings. If a full disability benefit is awarded after one year, the effective replacement rate drops to 70 per cent before tax, implying a replacement rate of about 80 per cent in after tax terms at average wages. The replacement rate at the statutory minimum wage is, by definition, 100 per cent, and the rates close to it are not much lower.[6] Moreover, an absolute dismissal ban is in force during the first two years of disablement.

2. Macro impact of the privatisation of sick pay

2.1. Absence rates dropped

Figure 1 shows absence rates for the 1952-2003 period and unemployment rates for 1970-2003. The absence rates are days lost to the sickness of Dutch employees, based on the absence records of consecutive panels of firms, maintained by the Central Statistical Office, and exclude pregnancy and maternity leaves.[7] Sickness absence rates in the Netherlands dropped from 6.4 per cent in 1991 to 5.4 per cent in 2001—roughly a 15 per cent drop (see Figure 1). Both these years represent a cyclical top, as indicated by the unemployment rate. A
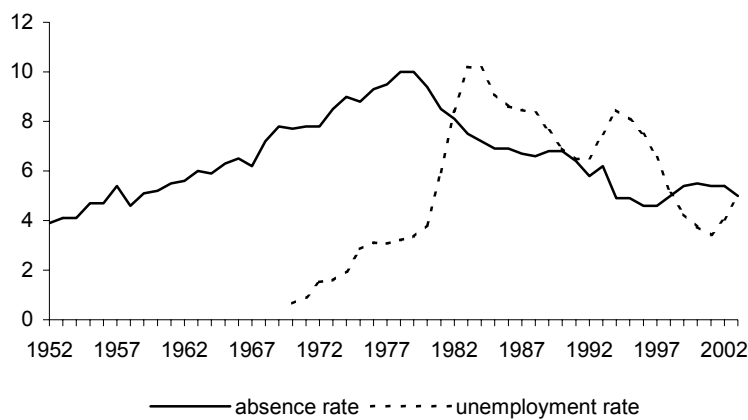
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[5] Entries of employees with a handicapped worker status into the disability benefit system are disregarded when calculating the firm-specific premium rate.

[6] In 2003, the minimum wage equals EUR 16,189.63 per year.

[7] As the time-series on absence rates is based on the absence records of a sample of firms, it is much less affected by shifts in administrative procedures than integral social insurance statistics would be.

comparison of these two years is a way of controlling for the influ-
ence of the business cycle on absenteeism. This comparison, however,
ignores the fact that, during this ten-year period, the Dutch labour
force grew by 18 per cent, and structural unemployment was much
lower in 2001 than in 1991. A much tighter labour market in 2001
would imply a higher—instead of a lower—absence rate than in 1991,
other things equal. Therefore, the 15 per cent decrease is a minimum
estimate of the effects of the institutional changes that took place be-
tween 1991 and 2001.[8]

Figure 1. Absence and unemployment rates in the Netherlands

Notes: Absence rates are expressed in days lost to sickness as a percentage of con-
tractual workdays. Days lost to pregnancy and parental leaves are excluded.
Source: Statline, Central Bureau of Statistics, Voorburg.

At least part of this drop in absenteeism can be ascribed to privati-
sation, and its associated incentives. This favourable result is mainly
obtained between 1994 and 1997, after a coinsurance period was in-
troduced for the first time. During the boom years of the late 90s, the
absence rate increased again but it stayed well below its previous
boom levels. As Figure 1 shows, the absence rates since 1994 are
lower than they have ever been since 1963.

[8] The aggregate number of vacancies as a percentage of the labour force increased
from 1.6 per cent in 1991 to 2.5 per cent in 2001.

The trend in the absence rate in Figure 1 covers a period of fifty years. It reflects the combined result of the effects of (1) the business cycle, (2) changes in social policy, (3) changes in tastes for market work among married women, (4) demographics and (5) changes in the production structure. While the first two factors influence the absence behaviour in a given population at risk, the latter three affect the composition of the population at risk by gender, age and branch of industry.

One important—endogenous—factor driving the trend in absenteeism is the introduction of the current Disability Insurance scheme in 1967. Its introduction meant a break with the past, because it covered all health contingencies (still does), it was extremely generous and accessible (less so now), and it had a fixed waiting period of twelve months. The last condition implies that about 30 per cent of the absence rate are due to those few cases (1.5 per cent of the insured population) that fulfil the waiting time—whether they pass the disability eligibility test or not. The steep increase in absenteeism during the 1970s is partly due to exploding disability benefit award rates. Equally, the drop in the absence rate after 1993 coincided with disability inflow rates reaching their lowest level since 1967.

Figure 2. Absence rates by type of construction worker, 1986-2000

Figure 2 shows the absence rates for several different types of construction workers. Before 1994, these rates varied between 10 and 16 per cent for blue-collar workers and about 4.5 per cent for white-collar workers. After 1994, they converge to a level at around seven per cent for blue-collar workers and around three per cent for white-collar workers. Privatisation clearly changed practices that used to be common in the construction industry. One of these was to sick list all employees between two projects, because permissions for temporary lay-offs were harder to obtain.

Table 1 shows absence rates by firm size over the 1993-2002 decade. During the 1994-1997 period, the level was four per cent among small and medium size firms and six per cent among firms with more than 100 employees. The smaller firms show a smaller increase after 1997 than those with more than 100 employees. After 1993, large firms have absence rates that are 50 per cent larger than small ones.

Table 1. Absence rates by firm size, excluding civil servants, and pregnancy and parental leaves, 1993-2002

Year	Total	10—100 employees	More than 100 employees
1993	6.2	6.0	7.0
1994	4.9	4.1	5.8
1995	4.9	4.2	5.8
1996	4.6	4.0	5.8
1997	4.6	4.1	6.0
1998	5.0	4.3	6.5
1999	5.4	4.5	6.9
2000	5.5	4.6	7.2
2001	5.4	4.7	7.2
2002	5.4	4.5	6.7

Source: CBS, Statline databank.

2.2. Most firms take out insurance

About 80 per cent of all firms took out some form of private insurance to cover their sickness liabilities. There appears to be a strong negative relationship between firm size and insurance coverage: while firms with less than 20 employees have a coverage rate of about 83 per cent, only 25 per cent of those with 100 or more workers buy an insurance. Larger firms also choose a larger coinsurance period or buy

a stop-loss arrangement (Veerman et al., 2001). To avoid adverse selection, most insurance companies stipulate that no employee be excluded from coverage under a sick-pay policy which the employer buys. Insurers also demand that firms contract occupational health agencies, and stipulate which set of services is to be contracted.

Survey data show that the selection of employees on the basis of health risks has not increased due to privatisation: in 1999, about one third of the firms report that they scrutinise applicants sharply on the basis of health. The same share did so around 1990.

Surprisingly, privatisation did not induce a surge in conflicts between workers who claim to be sick and employers who refuse to continue the payment of their wages. This may also be the result of the fact that the privatisation was enacted in a boom period. The current recession may be used to test to what extent private financing of sickness benefits is "weatherproof".

3. A description of the ZARA/SZW employers panel

3.1. The survey

The ZARA/SZW employer panel survey is constructed to analyse the effects of the institutional changes described above. The survey contains, apart from general firm characteristics, abundant information on sickness-absence rates, the sickness-absence policy of a firm and whether a firm has reinsured its sick pay liability by taking out private insurance. The data cover the period 1996-2000. Almost all sectors of the economy are covered. Only the sectors "Government" and "Education" were left out of this analysis. The panel is a stratified sample of Dutch firms. Strata are defined by five size-classes and 13 sectors of industry. In each of the 65 strata, a sample is taken of single firms or establishments from a national register of firms and establishments. The average sampling probability is 1 per cent. Firms with 2-9 employees are drawn with a 0.3 per cent probability and those with more than 100 employees have a sampling probability of 12 per cent (Schellekens et al., 1999).

The participating firms were interviewed three times in 1996, 1997, and 1998, and twice in 1999. 5,032 firms participated in the first wave of the survey and 2,753 firms in the last (twelfth) wave.

Table 2 shows the number of responses per wave. About 800 companies participated in all waves of the survey. This means that

attrition is quite substantive and that we have to take this into account in our empirical analyses. Footnote 10 in section 4 contains a technical discussion on this issue.

Table 2. Survey participation

Wave	Number of responses
1. March 1996	5032
2. September 1996	4028
3. December 1996	4264
4. March 1997	4264
5. September 1997	3393
6. December 1997	3341
7. March 1998	3618
8. September 1998	2983
9. December 1998	3061
10. March 1999	3339
11. December 1999	2841
12. March 2000	2753

3.2. Descriptives

The figures below give a first glance of some relevant information in the ZARA/SZW panel survey.

Figure 3a shows that the absence rates were relatively high in 1996 and relatively low in 1997. After 1997, absence rates remained more or less stable. The absence rates vary considerably among the different sectors and differ between large (more than 100 workers) and small firms. They are particularly high in the Care sector and relatively low in Catering.
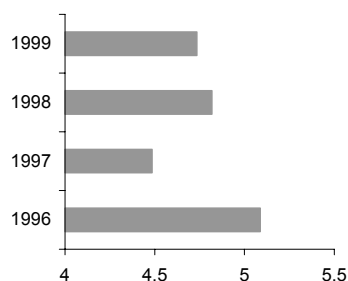
Figure 3a. Average sickness absence per year

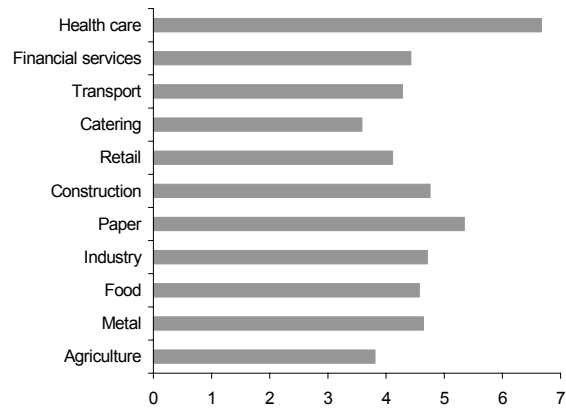**Figure 3b. Average sickness absence by sector**
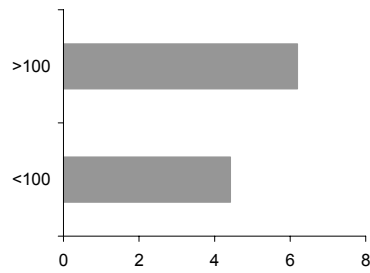

Figure 3c. Average sickness absence by firm size

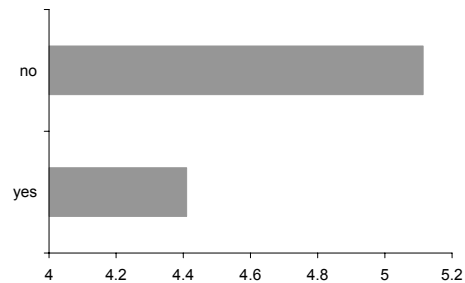**Figure 3d. Average sickness absence by insurance status**

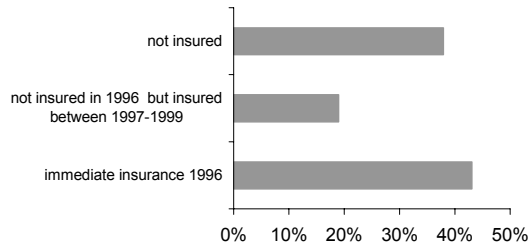**Figure 3e. Moment of purchase of insurance**

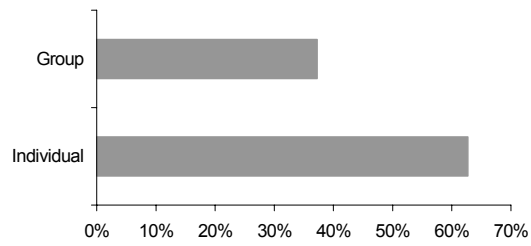**Figure 3f. Individual or group insurance**

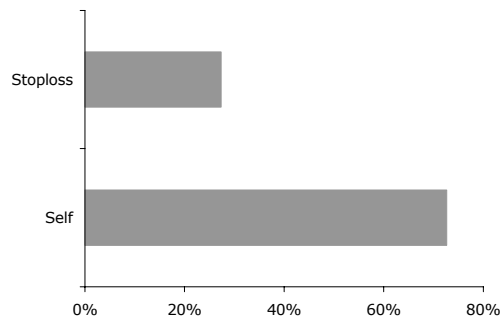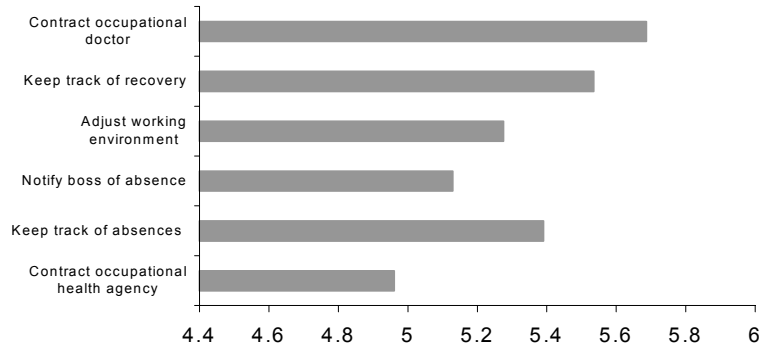**Figure 3g. Stoploss or self insurance**

Figure 3h. Average sickness absence by sickness policy

It is of interest (Figure 3d) that sick rates are low for firms that have insured their sick pay risk. Here, firm size is obviously a confounding factor: almost every small (say, less than fifty employees) firm buys insurance. But small firms also have lower sick rates, whatever the social insurance regime (see also Table 1). This implies that adverse selection effects are most likely absent. Figure 3e shows that about 42 per cent of the firms insured their sick pay risk immediately in 1996, about 18 per cent insured their sick pay risk at a later time and about 38 per cent did not insure their sick pay risk at all over the period of oberservation. About 32 per cent of those having insured their risk participate in a larger collective—mostly sectoral—insurance plan.

Firms may use sickness prevention programmes to reduce their absence levels. Figure 3h is informative on the effectiveness of some of these measures. Relatively low absence rates are observed for firms using the services of an occupational health agency. The label 'occupational doctor' refers to the situation where firms use the services of a physician to counsel sick workers.

We also performed a simple probit analysis that relates the insurance status to the set of sickness-prevention measures. The results (not included here) indicate that sickness-prevention measures that are associated with lower absence rates are more often used by insured firms.

4. Empirical models and results

4.1. A simple approach

Table 3 presents the results of some (simple) regressions where firm absence rates are related to a range of characteristics. Our focus is on the effect of the insurance status of the firm. The first column starts with a very simple specification, where only the insurance status of the firm is included as an explanatory variable. The results confirm what we already saw in Figure 3c. Firms re-insuring their sick pay risk have lower absence rates, even after controlling for size. The coefficients are large and significant. In the second specification (second column), we add some firm characteristics, most of which are strongly significant. In particular, this holds for the Firm Size and Care sector variables. More importantly, the size of the re-insurance dummy is reduced by more than half.

In the third column, we add sickness-policy measures to the model. The impact of re-insurance is further reduced. Some of the sickness policy measures have a strong and significant effect, and some of these effects are at variance with what would be expected. For instance, Occupational Health measures do not seem to be very effective in reducing firm absence rates. Quite on the contrary, significantly higher absence rates are observed for firms using these measures.

It is difficult to rationalise these results in terms of purely causal effects. "Bad" firms with relatively high absence rates may decide to use the services of an agency for occupational health and safety to reduce these high absence rates. Similarly, the best performing firms, with low absence rates, may find it easier to get their sickness risk insured. Or it could be the case that the "better" performing firms more often choose to re-insure their sick pay risk because they are offered insurance policies at a low cost. Anyhow, the consistently negative sign of the insurance status dummy indicates that adverse selection among firms choosing to re-insure their sick pay liability, and moral hazard as a result of insuring away the incentives of privatisation, are absent.

Table 3. Firm sickness absenteeism rates (per cent): OLS regression results

Variable	Specification I		Specification II		Specification III	
	Para-meter	t-value	Para-meter	t-value	Para-meter	t-value
Constant	5.1140	91.70	5.2031	11.93	3.3543	7.05
Insurance = yes	-0.7044	-8.99	-0.2885	-3.45	-0.1648	-1.94
Firm characteristics						
Less then 100 workers			-1.3563	-12.79	-0.8364	-7.72
per cent female			0.0050	2.70	0.0084	4.47
per cent younger than 20			-0.0052	-0.95	-0.0114	-2.13
per cent between 20-30			-0.0061	-1.66	-0.0068	-1.90
per cent between 30-40			0.0034	0.85	0.0006	0.14
per cent between 40-50			0.0079	1.70	0.0059	1.31
per cent fixed contract			-0.0021	-0.99	-0.0040	-1.80
Agriculture			0.3683	1.30	0.1767	0.62
Metal			0.8725	3.35	0.3421	1.30
Food			0.7516	2.82	0.1534	0.57
Industry			0.8883	3.26	0.2058	0.75
Paper			1.5450	5.92	1.0283	3.91
Construction			1.1034	4.16	0.4674	1.75
Retail			0.4752	1.78	-0.0608	-0.23
Bars & restaurants			-0.0249	-0.08	-0.4546	-1.53
Transport			0.5503	2.06	0.0453	0.17
Financial services			0.5105	1.97	0.0494	0.19
Care			2.5527	9.57	1.7899	6.59
Year						
Year 1997			-0.5109	-4.91	0.4758	2.76
Year 1998			-0.0373	-0.12	-0.3370	-1.09
Year 1999			-0.1281	-0.41	-0.6413	-2.05
Sickness policy measures						
Contract occupational health agency					1.1327	6.59
Keep track of absences					-0.1470	-1.34
Notify boss personally of absence					-0.0787	-0.54
Risk evaluation					0.1936	2.10
Adjust work environment					-0.2954	-2.62
Keep track of recovery					0.5826	4.47
Contract occupational doctor					1.5400	11.90
R-squared	0.0840		0.2500		0.3050	
# Observations	9177		9177		9177	

4.2. A more rigorous approach

The fundamental problem we face is that we only observe the behaviour of firms *after* the change in the system. Therefore, the identification of any effect, if present, must come from a delayed response to

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the change in the system of some (groups of) firms. More specifically, consider a model where firm-specific absence rates (A_{it}) are related to a range of firm characteristics (X_{1it}), a set of sickness-prevention measures (X_{2it}), whether the firm has privately insured the sick pay risk (S_{it}), a firm-specific effect (δ_i) and an idiosyncratic shock (u_{it}) in the following way:

$$A_{it} = X_{1it}'\alpha + X_{2it}'\beta + S_{it}\gamma + \delta_i + u_{it.}$$ (1)

It is assumed that δ_i and u_{it} are independent. The effects of the variable S_{it} and the set X_{2it} are of particular relevance. For convenience, we focus on the effect of S_{it} alone, but all arguments that we supply will, of course, also hold for the measurement of the effects of X_{2it}. The measurement of the effect of S_{it} is complicated by two factors.

Firstly, the change in the system took place at the beginning of 1996 and affected *all* firms at the same time. Suppose now that all firms decided to privately insure their sick pay risk at the very moment that the new system became effective. This would imply that in the first wave of our sample, all firms have insured their sick pay risk. In that case, it will be very difficult to disentangle the effect of the insurance status from other changes in the (macro-) economic environment, such as the business cycle. Hence, for the estimation of the effect of S_{it}, we require that a sufficiently large fraction of firms does not insure themselves immediately, but at some point later in time, after the system change. In addition, we have to assume that the effect of the insurance status (γ) for the firms insuring themselves at a later point in time, is the same as the effect of the firms immediately insuring themselves[9].

Secondly, S_{it} is a choice variable. The decision to privately insure the sick pay risk may depend on firm-specific circumstances that also influence the absence rate in the firm. More formally, this means that S_{it} may not be orthogonal (independent) to either δ_i or u_{it}. In line with the larger part of the empirical micro-econometric literature, we assume that S_{it} is orthogonal to the idiosyncratic shock (u_{it}), but possibly not to the time persistent unobservable firm-specific attributes (δ_i). The usual way of dealing with this simultaneity problem is to extend

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[9] So there is a homogeneous treatment effect.

model (1) with an extra equation for S_{it}, or to directly specify the cor-
relation between δ_i and S_{it} (see, for instance, Mundlak, 1976, or
Chamberlain, 1980), i.e., to use a fixed-effect approach. It is the latter
(fixed-effect) approach that we take. The method does not require
additional assumptions concerning the correlation between δ_i and S_{it}
and deals directly with any possibly non-random attrition that we may
have in our sample[10].

The fixed-effect method boils down to estimation of the first dif-
ferences of (1). The effect of S is then identified from changes in the
insurance status of firms that did not immediately insure themselves
in 1996. Figure 3e shows that this concerns about 18 per cent of our
sample.

4.3. Results

Table 4 reports results of the fixed-effect regression. This regression
boils down to the estimation of a first differenced version of equation
(1). As a result, all time-invariant covariates (like sector) cancel from
the specification. Therefore, Table 4 includes only time-varying co-
variates.

The results in Table 4 strongly contrast with those in Table 3. In
Table 4, nothing is left of the strong and significant effects of the pri-
vate insurance indicator and the Sickness policy measures that we
found in Table 3. Correcting for the endogenous nature of the choice
variables, like whether to privately insure the sick pay risk, leads to
small and non-significant effects. Consequently, we find little evi-
dence of a causal effect of re-insurance status and sickness policy
measures on firm absence rates.

In Figure 3a, one can clearly see a reduction of the absence rates
after 1996, which is apparently not caused by the insurance status and
the sickness policy measures. Since we consider a relatively short pe-
riod, it is not likely that compositional effects may have caused the
decline in the absence rates. The results of Table 4 are based on
changes in the insurance status after 1996. Thus, in the estimation,
firms which never re-insure themselves, or immediately buy re-

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[10] Suppose that attrition is governed by a latent index M^*; in most practical situations one then specifies
a model for M^* and uses this to construct conditional moments to correct for selectivity.
More specifically, of relevance is $E[A_{it} \mid M_i^* > 0] = X_{1it}'\alpha + X_{2it}'\beta + S_{it}\gamma + E[\delta_i \mid M_i^* > 0]$. $E[\delta_i \mid M_i^* > 0]$ is
constructed from the parameters of the sample attrition model M^*. It is of interest for our purposes that
this moment varies per individual, but not over time and that therefore, difference regressions (such as
the fixed-effect method) of firm absence rates only depend on differences in X_{1it}, X_{2it}, S_{it} and u_{it}.

insurance and stay insured, are eliminated from the analyses. With
model (1), we implicitly assumed that the firms insuring themselves
directly and those insuring themselves at a later point are behaviour-
ally equivalent. One could look at this further by examining the ab-
sence rates of the different types of firms.

Table 4. Firm sickness absenteeism rates (per cent): fixed effect regression

Variables	Parameter	t-value
Constant	-0.3157	-2.18
Private insurance	-0.0618	-0.42
Contract occupational health agency	0.2934	1.09
Keep track of absences	0.1357	1.43
Notify boss personally of absence	0.0392	0.30
Risk evaluation	0.1256	1.26
Adjust work environment	0.0426	0.40
Keep track of recovery	-0.1196	-0.99
Contract occupational doctor	0.1737	1.41
R-square	0.124	
# Observations	6792	

Figure 4. Absenteeism for different type of firms

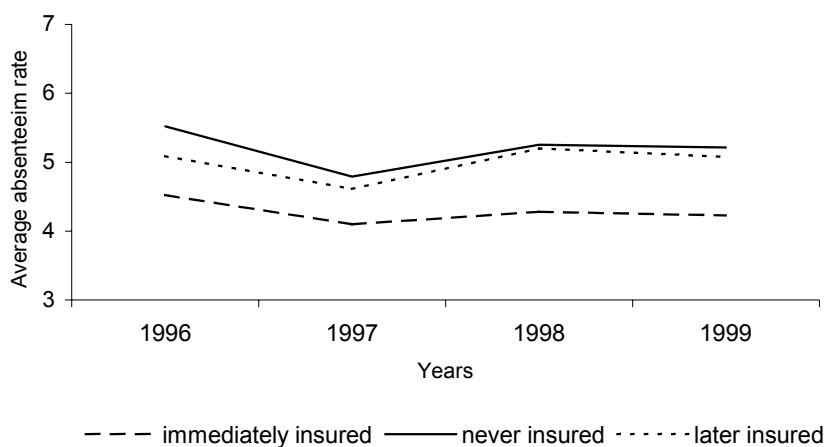Figure 4. Absenteeism for different type of firms

Figure 4 tells us that the absence rates of firms immediately insur-
ing themselves are substantially lower than those of other firms. We
also saw this in Figure 3d. In addition, Figure 4 shows us that the ab-

sence rates of firms immediately insuring themselves remain at a rela-
tively low level, whereas the absence rates of the other firms increase
slightly after 1997. Hence, there is some evidence for differences in
the behaviour of the different types of firms. Small firms may be
more sensitive to the incentives induced by the privatisation and
therefore, the response of small and large firms may also be different.
Therefore, we also estimated different models and detailed Figure 4
by firm size. We did not find different results, however. Likewise, the
type of contract (stop loss or not) may lead to different results. Again,
the results remained the same.

5. Conclusions

Our main conclusion must therefore be that from the data, one can
directly see that the privatisation of sick pay induced a marked decline
in absenteeism in the Netherlands. This decline took place in a period
of high economic growth, where one would normally have expected
higher absence rates.

Our data only allow us to identify the causal effect of the insurance
status and the observed sickness policy measures from the observed
behaviour of firms choosing to re-insure their sick pay risk after the
start of privatisation in 1996. For this purpose, we had to assume that
the behaviour of this group was similar to that of the groups having
insured themselves immediately. The results point at no effects of the
relevant indicators observed in our data. For one thing, the insignifi-
cance of the effect of re-insurance on the sick rate implies that neither
adverse selection nor moral hazard affected the outcomes.

We further look at the underlying assumption of equal behaviour
and find some evidence of differential behaviour between the differ-
ent types of firms. All firms, however, have substantially lower ab-
sence rates after 1996. This may imply that the privatisation had an
effect on the firm absence rates, for instance, because the change in
the system required a more alert response of firms towards the ab-
sence behaviour of employees. This is, however, not picked up by the
observed sickness policy measures and insurance status variables that
we observe in our data. More detailed analyses require more informa-
tion on the firms' strategies to fight absenteeism, firm absence rates
before 1996, but also information for a longer time span, which also

covers periods of economic downturn. We leave this to future research.

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