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RENSELGI KANGA, ANTHONY TERRIAU

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Workplace Prevention, Sickness Absence, and Experience Rating

Renselgi Kanga* Anthony Terriau†

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Abstract

Sickness absence reduces output, a cost borne by firms, and generates public costs in the form of sickness benefits, medical costs and lost social contributions. When these public costs are financed by a common payroll contribution, firms do not bear them, which weakens their incentives to invest in workplace prevention and raises sickness absence. We study this fiscal externality in a search-and-matching model in which firms and workers choose prevention. Experience rating, which charges each firm the public cost of its workers' absence, restores these incentives. Under the Hosios condition, full experience rating implements the optimal allocation. When sectors differ in their sickness risk, however, it penalizes the sectors whose risk is intrinsically higher. One may then prefer sector-relative experience rating, a bonus-malus that benchmarks each firm against the average of its sector. We calibrate the model to France. Full sector-relative experience rating reduces sickness absence, and hence its public cost, by 17%. The contribution rate required to balance the budget falls from 2.0% to 1.6% of wages, which lowers labor costs and raises output and welfare without reducing employment.

Keywords: Sickness absence; Workplace prevention; Experience rating; Search and matching; Payroll taxes; Social insurance.

JEL Codes: I13, I18, J32, J64.

*Le Mans Université, GAINS-TEPP, Avenue Olivier Messiaen, 72085 Le Mans Cedex 9, France.

†Le Mans Université, GAINS-TEPP, Avenue Olivier Messiaen, 72085 Le Mans Cedex 9, France. Corresponding author. Email: anthony.terriau@univ-lemans.fr.

1 Introduction

Sickness absence reduces effective labor input, a cost borne by firms, and generates substantial public costs. In France, these costs are financed to a large extent by social contributions, which are almost entirely paid by employers and are the main resource of the health insurance branch (38%, Direction de la Sécurité Sociale, 2023). Contributions are levied at a rate that does not depend on the sickness absence of each firm's workers, so that firms do not bear the public cost of their own workers' absence. This pooled financing generates implicit transfers across firms, but it also weakens their incentives to invest in workplace prevention. The question is relevant in a country where prevention receives comparatively little funding. In 2019, it accounted for less than 2% of health spending, against 3% on average in the European Union (OECD and European Observatory on Health Systems and Policies, 2021).

This paper analyzes how pooled financing of the public costs of sickness absence affects prevention. The key distortion is fiscal. A day of absence entails sickness benefits, medical costs, and a loss of social contributions because the wage is not paid. Since these costs are financed by a uniform payroll contribution, firms and workers take the contribution rate as given and do not internalize the savings generated by prevention. Prevention is therefore too low. This inefficiency provides a rationale for experience-rated contributions, under which each firm bears the public costs generated by the sickness absence of its workers. We study it in a search-and-matching model, for two reasons. First, in France, health insurance is financed by contributions levied on wages, which means that the budgetary implications of a reform depend on how wages and employment respond. Second, the main objection to experience rating is that it would raise labor costs and destroy jobs. Assessing this objection requires a model in which wages, labor costs and job creation are determined in equilibrium.

Experience rating is used in unemployment insurance and in workers' compensation, and its extension to sickness insurance is debated in France. The French occupational accidents and diseases branch already relies on experience rating, with a degree that increases with firm size, and Lengagne (2026) shows that a 2012 reform that strengthened it for medium-size firms reduced work-related absence and improved the employment of incumbent workers. Extending experience rating to ordinary sick leave has received support from several actors of the debate. A report commissioned by the French government proposed to modulate the employer health contribution according to the firm's sickness absence relative to its sector (Bérard et al., 2019). The Caisse Nationale de l'Assurance Maladie (CNAM), the national health insurance fund, lists an employer bonus-malus on short-term sickness absence among its options to contain the cost of sick leave (CNAM, 2025). During the debate on the 2026 social security budget, an amendment proposed rebates and surcharges on employer contributions according to the firm's sickness benefits relative to its sector average, to encourage prevention (Assemblée nationale, 2025). The general secretary of MG France, a union of general practitioners, advocates a bonus-malus modeled on the contributions of the occupational accidents and diseases branch (Laboris, 2026). Critics of experience rating argue that it would raise labor costs and thereby destroy jobs. This paper provides an ex ante evaluation of such a reform, and our model is designed to assess this concern. We find that experience rating induces firms to invest in prevention, which reduces sickness absence and the contributions paid by firms. Labor costs do not rise,

and employment is almost unchanged.

Our paper relates to several strands of literature. A large literature shows that sickness absence responds to financial incentives. On the workers' side, absence responds to the generosity of sick pay (Johansson and Palme, 2005; Ziebarth and Karlsson, 2010; Pettersson-Lidbom and Skogman Thoursie, 2013; De Paola et al., 2014). On the employers' side, it also responds to the share of the cost of absence that employers bear (Fevang et al., 2014; Koning and Lindeboom, 2015; Böheim and Leoni, 2020). These studies estimate behavioral responses. We take such a response as given and study how the financing of sickness insurance should be designed in equilibrium.

In unemployment insurance, the incomplete experience rating of the U.S. system lets firms shift part of the cost of their layoffs onto the insurance fund, which subsidizes temporary layoffs (Feldstein, 1976; Brechling, 1977; Topel, 1983). Stronger experience rating reduces the incidence of unemployment (Topel, 1984) and its cyclical and seasonal fluctuations (Card and Levine, 1994), and it shapes job creation and destruction (Ratner, 2013) and the use of recalls (Albertini et al., 2023), although the incentives depend on the experience-rating formula (Miller and Pavosevich, 2019). On the theoretical side, our efficiency result is the counterpart, for sickness insurance, of the result that a layoff tax equal to the unemployment benefits triggered by a separation implements the optimal allocation (Blanchard and Tirole, 2008), and experience rating of unemployment insurance is likely to lower unemployment in labor markets with high firing costs (Cahuc and Malherbet, 2004). In both cases, experience rating makes firms internalize the public cost of the events that their decisions affect.

In occupational health and safety, experience rating encourages firms to improve working conditions and to manage absences (Thomason and Pozzebon, 2002; Lengagne, 2016, 2026). It reduced the incidence of musculoskeletal disorders and the associated absences in high-prevalence sectors in France (Lengagne and Afrite, 2015), and a systematic review finds moderate evidence that it reduces the frequency and severity of injuries (Tompa et al., 2012). Closest to our paper, Ménard and Quintero Rojas (2018) show, in a search model with low-risk and high-risk jobs, that uniform health insurance contributions generate cross-subsidies between firms that distort the composition of jobs and lower productivity. We instead let firms choose prevention within jobs, and we quantify the effects of experience rating for France. More broadly, Aizawa and Fang (2020) incorporate health insurance into an equilibrium search model of the labor market.

The paper makes two contributions. First, we characterize the fiscal externality of pooled financing in a search-and-matching model in which firms and workers choose prevention. Full experience rating, combined with the Hosios condition, implements the optimal allocation. With sectoral heterogeneity, experience rating involves a trade-off between efficiency and redistribution across sectors, which sector-relative experience rating, by benchmarking each firm against its sector, resolves at the cost of a small distortion of job creation.

Second, we provide a quantitative ex ante evaluation of experience rating for ordinary sickness absence in France, where the public cost of absence amounts to about €20 billion per year once the social contributions lost during absence are counted. Unlike reduced-form studies, the model quantifies how much of the response of absence is a gain in resources, how it affects wages, labor costs and job creation, and how costs are distributed across sectors. We obtain three main

results. First, full experience rating reduces sickness absence by 17%. The output gained and the medical costs saved exceed the additional prevention costs by about €2 billion per year, which raises welfare by 0.16%. Second, it does not raise labor costs. As absence declines, the contributions paid by firms fall by 17%, labor costs per employee are almost unchanged, and the employment rate falls by only 0.1 percentage point. Third, sector-relative experience rating achieves the same reduction in absence and almost the same welfare gain, while largely preserving the transfers to high-risk sectors. The common contribution rate falls from 2.0% to 1.6% of wages, labor costs fall by 0.2%, and employment rises slightly. This scheme does not penalize firms for the risk of their sector, which makes it closer to what could be implemented in practice. We also find that most of these gains are obtained with partial experience rating. Charging firms only the sickness benefits of their workers, as currently debated, already achieves about 70% of the welfare gain.

The remainder of the paper is organized as follows. Section 2 presents the model and Section 3 experience rating. Section 4 presents the data and the calibration, and Section 5 the results. Section 6 discusses the limits of the analysis and how experience rating could be designed in practice. Section 7 concludes.

2 Model

We first present the model with a single sector, in which we derive our analytical results. Sectors are introduced in Section 3.3, and the quantitative analysis relies on the economy with sectors.

2.1 Environment

Time is discrete. The economy is populated by a unit mass of workers, who are either employed or nonemployed. We do not distinguish unemployment from inactivity. Nonemployed workers search for jobs and obtain a flow value from home production. Matches are destroyed exogenously with probability $\delta \in (0,1)$. The discount factor is $\beta \in (0,1)$.

Matching technology. Let u denote the nonemployment rate, so that $1-u$ workers are employed, and v the vacancy rate. Let $\mu > 0$ denote matching efficiency and $\eta \in (0,1)$ the elasticity of matches with respect to nonemployment. Matches are formed according to the constant-returns matching function

$$m(u,v) = \mu u^{\eta} v^{1-\eta}. \tag{1}$$

Define labor-market tightness as $\theta = v/u$. The associated job-finding and vacancy-filling rates are

$$p(\theta) = \mu \theta^{1-\eta}, \qquad q(\theta) = \mu \theta^{-\eta}. \tag{2}$$

Nonemployment evolves according to

$$u' = u\,(1 - p(\theta)) + (1-u)\delta, \tag{3}$$

and stationary nonemployment satisfies

$$u(\theta) = \frac{\delta}{\delta + p(\theta)}. \tag{4}$$

Sickness absence. An employed worker produces $y > 0$ units of output per period when present and is absent for sickness a fraction $\lambda(x)$ of the time, which depends on the prevention effort x described below. We refer to λ as the sickness absence rate, i.e. the probability of being absent on a given day. A full period of absence generates a public cost

$$c_H = \underbrace{\underbrace{\underbrace{c_B}_{\substack{\text{sickness}\\ \text{benefits}}} + \underbrace{c_T}_{\substack{\text{lost}\\ \text{contributions}}}}_{\text{transfers}} + \underbrace{c_M}_{\substack{\text{medical}\\ \text{costs}}}}_{\text{social cost}}, \tag{5}$$

borne by social insurance: sickness benefits c_B, which replace part of the wage; the social contributions c_T lost because the wage is not paid, sickness benefits bearing much lower contributions; and medical costs c_M. Medical costs are a social cost, since they use real resources such as doctors' time and drugs. Sickness benefits and lost contributions are transfers between the match and social insurance. They are not social costs, but they reduce the cost of absence borne by the match. We denote by $\gamma \in (0, 1)$ the share of output lost during absence net of these transfers, $\gamma y = y - c_B - c_T$. The cost of a period of absence for the match under pooled financing is thus γy. Each job also uses capital services, at a cost $k \geq 0$ per period that does not depend on sickness absence. The cost of capital plays no role in the theoretical results. It allows the calibration to reproduce the share of compensation of employees in value added (Section 4.5). The resources of a match, net of the cost of capital, are therefore

$$y(1 - \lambda(x)\gamma) - k, \tag{6}$$

and the social cost of absence, $\gamma y + c_H$, is the output lost plus medical costs.[1] Absence thus generates a public cost $c_H > 0$ that the match does not bear under pooled financing.

Prevention technology. In each period, the worker and the firm jointly choose prevention effort $x \geq 0$ to maximize the match surplus. The wage is then set by Nash bargaining, and sickness, production and separation shocks are realized. Prevention reduces sickness risk according to

$$\lambda(x) = \lambda_0 - g(x), \tag{7}$$

where λ_0 denotes sickness risk in the absence of workplace prevention. We assume $g'(x) > 0$ and $g''(x) < 0$. Prevention costs are given by $\psi(x)$, with $\psi'(x) > 0$ and $\psi''(x) > 0$.

[1] Since the wage is bargained, how sickness benefits are shared between the worker and the firm does not affect the allocation. An employer complement to sickness benefits is also a transfer within the match. It matters only because contributions are due on it, which reduces c_T (Section 4.5).

2.2 Decentralized equilibrium

Workers. Let w denote the negotiated per-period wage and b the flow value of home production during nonemployment. The values of employment, W, and nonemployment, U, are

$$W = w + \beta[(1-\delta)W + \delta U], \tag{8}$$

$$U = b + \beta[p(\theta)W + (1-p(\theta))U]. \tag{9}$$

Firms. Let τ denote the uniform payroll contribution rate that finances the public costs of sickness absence and c_v the cost of posting and maintaining a vacancy. The values of a filled job, J, and of a vacancy, V, are

$$J = y(1-\lambda(x)\gamma) - k - \psi(x) - (1+\tau)w + \beta[(1-\delta)J + \delta V], \tag{10}$$

$$V = -c_v + \beta[q(\theta)J + (1-q(\theta))V]. \tag{11}$$

Match surplus and prevention. Define the decentralized match surplus as $S \equiv (W-U) + (J-V)$. Using the Bellman equations,

$$S = \frac{w-b}{1-\beta[1-\delta-p(\theta)]} + \frac{y(1-\lambda(x)\gamma) - k - \psi(x) - (1+\tau)w + c_v}{1-\beta[1-\delta-q(\theta)]}. \tag{12}$$

The worker and the firm first agree on the prevention effort that maximizes the size of the pie, and then bargain over its division. Since Nash bargaining gives each party a fixed share of the match value $\Omega(x)$, by (14) and (16) below, both agree to maximize $y(1-\lambda(x)\gamma) - k - \psi(x)$, and the prevention condition is

$$\underbrace{\psi'(x)}_{\text{marginal cost}} = \underbrace{\gamma y g'(x)}_{\text{marginal private gain}}. \tag{13}$$

The match equates the marginal cost of prevention to its marginal private gain, the reduction in the output lost net of transfers. Under pooled financing, it does not internalize the reduction in the public costs of absence associated with lower sickness risk.

Wage bargaining. Conditional on prevention effort x, the wage solves $\max_w (W-U)^\alpha (J-V)^{1-\alpha}$, where $\alpha \in (0,1)$ denotes the worker's bargaining power. Appendix A derives the equilibrium wage

$$w = b + \frac{\alpha[1-\beta(1-\delta)+\beta p(\theta)]}{(1+\tau)[1-\beta(1-\delta)+\alpha\beta p(\theta)]}\,\Omega(x), \tag{14}$$

where $\Omega(x)$ denotes the decentralized match value:

$$\Omega(x) = \underbrace{y(1-\lambda(x)\gamma)}_{\substack{\text{output net}\\ \text{of absence}}} - \underbrace{k}_{\text{capital}} - \underbrace{\psi(x)}_{\text{prevention}} - \underbrace{(1+\tau)b}_{\substack{\text{outside}\\ \text{option}}}. \tag{15}$$

Job creation. Under free entry, $V = 0$, so that $c_v/q(\theta) = \beta J$. Substituting the wage yields

$$J = \frac{1-\alpha}{1-\beta(1-\delta)+\alpha\beta p(\theta)}\,\Omega(x), \tag{16}$$

and the job-creation condition

$$\frac{(1-\alpha)p(\theta)}{\theta}\,\Omega(x) = c_v\left[\frac{1}{\beta} - (1-\delta) + \alpha p(\theta)\right]. \tag{17}$$

Public budget. Under pooled financing, the public costs of sickness absence (sickness benefits, lost contributions and medical costs) are financed by the payroll contribution rate τ:

$$\underbrace{\tau w(1-u)}_{\substack{\text{contributions}\\ \text{collected}}} = \underbrace{\lambda(x)c_H(1-u)}_{\substack{\text{public costs}\\ \text{of absence}}} \quad \Rightarrow \quad \tau = \frac{\lambda(x)c_H}{w}. \tag{18}$$

Atomistic matches take τ as given when choosing prevention effort.

Equilibrium. A stationary decentralized equilibrium is a tuple (x, w, θ, u, τ) such that: (i) prevention satisfies (13); (ii) the wage is given by (14); (iii) tightness satisfies (17); (iv) nonemployment is stationary; and (v) the social insurance budget (18) balances.

2.3 Optimal allocation

The planner internalizes all the effects of prevention on sickness risk, output losses and medical costs, subject to the same matching frictions. Wages, payroll contributions, sickness benefits and lost contributions are transfers. Define the planner match value

$$\Omega^{\text{pl}}(x) \equiv y(1-\lambda(x)\gamma) - k - \psi(x) - \lambda(x)c_H - b = y - k - \lambda(x)\left(\gamma y + c_B + c_T + c_M\right) - \psi(x) - b, \tag{19}$$

where the second expression shows that, for each period of absence, the planner counts the whole output lost, $y = \gamma y + c_B + c_T$, and medical costs. Transfers cancel out. The planner chooses x and θ to maximize

$$\mathcal{W}(u) = \max_{x,\theta}\left\{(1-u)\Omega^{\text{pl}}(x) + b - c_v\theta u + \beta\mathcal{W}(u')\right\} \quad \text{s.t.} \quad u' = u(1-p(\theta)) + (1-u)\delta. \tag{20}$$

Appendix B shows that the optimal prevention effort and tightness satisfy

$$\underbrace{\psi'(x^\star)}_{\substack{\text{marginal}\\ \text{cost}}} = \Big(\underbrace{\gamma y}_{\substack{\text{private cost}\\ \text{of absence}}} + \underbrace{c_H}_{\substack{\text{public cost}\\ \text{of absence}}}\Big)\, g'(x^\star), \tag{21}$$

$$\frac{(1-\eta)p(\theta^\star)}{\theta^\star}\,\Omega^{\text{pl}}(x^\star) = c_v\left[\frac{1}{\beta} - (1-\delta) + \eta p(\theta^\star)\right]. \tag{22}$$

Relative to (13), the planner internalizes the additional gain $c_H g'(x^\star)$. The match ignores that absence triggers sickness benefits paid from outside the match, medical costs financed by social insurance and a loss of social contributions.

3 Experience rating

Under pooled financing, the match does not internalize the effect of prevention on the public costs of sickness absence, so that prevention is too low. This section analyzes experience rating,

which makes each firm bear the public costs generated by the absence of its workers, and shows to what extent it restores the incentives to invest in prevention.

3.1 Experience-rated contributions

Firms are charged a fraction $\kappa \in [0,1]$ of the expected public cost (sickness benefits, lost contributions and medical costs) associated with sickness absence among their workers. When $\kappa = 0$, these costs are fully pooled; when $\kappa = 1$, each firm fully bears them. In practice, charging firms the public cost of absence would combine two instruments. The first is a charge equal to the sickness benefits and medical costs of their workers, as in existing experience-rating schemes. The second is the requirement that social contributions remain due on the wage of workers on sick leave, which makes the firm bear the contributions lost because of the absence. A scheme limited to sickness benefits corresponds to $\kappa = c_B/c_H$.

In the model, where agents are risk neutral, lower sickness benefits or longer waiting periods would also raise the private cost of absence. We focus on experience rating for two reasons. First, sickness benefits insure workers against the loss of income during sickness, which the model does not value, and experience rating restores the incentives to prevent absence without reducing this insurance. Second, employers control working conditions, and charging firms targets those who decide on workplace prevention.

The decentralized match value becomes

$$\Omega^{\mathrm{ER}}(x) = \underbrace{y(1-\lambda(x)\gamma)}_{\substack{\text{output net}\\ \text{of absence}}} - \underbrace{k}_{\text{capital}} - \underbrace{\psi(x)}_{\text{prevention}} - \underbrace{\kappa\lambda(x)c_H}_{\substack{\text{experience-}\\ \text{rating charge}}} - \underbrace{(1+\tau)b}_{\substack{\text{outside}\\ \text{option}}}, \tag{23}$$

and the remaining share is financed through the payroll contribution rate:

$$\tau w(1-u) = (1-\kappa)\lambda(x)c_H(1-u) \quad \Rightarrow \quad \tau = \frac{(1-\kappa)\lambda(x)c_H}{w}. \tag{24}$$

The prevention condition becomes

$$\psi'(x^{\mathrm{ER}}) = K\, g'(x^{\mathrm{ER}}), \qquad K \equiv \gamma y + \kappa c_H, \tag{25}$$

where K is the private cost of sickness absence borne by the match. Condition (25) nests the pooled benchmark (13) when $\kappa = 0$ and coincides with the planner's condition (21) when $\kappa = 1$. Tightness is determined by (17) with Ω^{ER} in place of Ω.

Proposition 1. *Under full experience rating ($\kappa = 1$) and the Hosios condition ($\alpha = \eta$), the decentralized equilibrium implements the optimal allocation: $x^{\mathrm{ER}} = x^\star$ and $\theta^{\mathrm{ER}} = \theta^\star$.*

The proof is in Appendix C. With $\kappa = 1$, the payroll contribution vanishes by (24), so that $\Omega^{\mathrm{ER}}(x^\star) = \Omega^{\mathrm{pl}}(x^\star)$, and the two job-creation conditions coincide when $\alpha = \eta$.

Comparing the decentralized and planner match values also shows how experience rating affects employment. When $\kappa < 1$, the payroll contribution is largely shifted to wages through bargaining. A job bears it only through τb, which is less than the public cost of its absence that it does not bear directly, $(1-\kappa)\lambda c_H$. Job creation is implicitly subsidized. Pooled financing leads

to excessive job creation, $\theta(0) > \theta^\star$, if this subsidy exceeds the gain from optimal prevention, $\Omega^{\text{pl}}(x^\star) - \Omega^{\text{pl}}(x(0)) \approx \frac{1}{2} c_H |\Delta\lambda|$ (Appendix D). With $\tau = \lambda c_H / w$, this condition reads $(1 - b/w)\lambda > \frac{1}{2}|\Delta\lambda|$, which holds in our calibration. Experience rating then reduces sickness absence and moves tightness down to its optimal level, so that employment falls slightly. Under sector-relative experience rating, the payroll contribution remains positive and job creation remains implicitly subsidized in most sectors (Section 3.3), so that employment need not fall.

3.2 The welfare gains of experience rating

Let $K_0 = \gamma y$ denote the private cost of a period of absence under pooled financing, $\varepsilon_K \equiv d \ln \lambda / d \ln K$ the elasticity of sickness absence with respect to this cost, and $\mathcal{W}(\kappa)$ welfare along the equilibrium path that starts from pooled financing when the degree of experience rating is set to κ.

Proposition 2. *Under the Hosios condition ($\alpha = \eta$), to a second-order approximation around the optimal allocation:*

(i) the welfare gain of full experience rating is

$$\mathcal{W}(1) - \mathcal{W}(0) \approx \frac{1}{1-\beta} \left[\frac{1}{2} (1-u)\, \lambda\, |\varepsilon_K| \, \frac{c_H^2}{K_0} \right] + \Delta\mathcal{W}_\theta, \tag{26}$$

where the first term is the gain from prevention and $\Delta\mathcal{W}_\theta \geq 0$ the gain from the correction of job creation;

(ii) the welfare gain of experience rating of degree κ is a share $2\kappa - \kappa^2$ of the gain of full experience rating:

$$\mathcal{W}(\kappa) - \mathcal{W}(0) \approx (2\kappa - \kappa^2) \left[\mathcal{W}(1) - \mathcal{W}(0) \right]. \tag{27}$$

The proof is in Appendix D. Each period of absence avoided yields a net gain between c_H for the first units of additional prevention and zero for the last ones, i.e. $c_H/2$ on average, and the decline in absence is proportional to $|\varepsilon_K|\, c_H / K_0$. Since the remaining gap between the social and the private cost of absence is $(1-\kappa)c_H$, the first steps of experience rating yield most of the gain. The welfare gain thus comes mainly from prevention, and the search-and-matching structure determines how wages, contributions and employment adjust. All the inputs of the formula can be measured or estimated, so that it can be applied to other countries or branches of social insurance.

3.3 Sectoral heterogeneity and sector-relative experience rating

Some sectors have a higher sickness risk because of the nature of their activity, such as physically demanding tasks or hazardous environments, rather than because of their prevention behavior. Uniform experience rating would mechanically impose higher contributions on them. We compare it with a scheme that benchmarks each firm against its sector.

Segmented labor markets. The economy consists of n sectors indexed by $s = 1, \ldots, n$, each populated by a fixed mass N_s of workers, with $\sum_s N_s = 1$. Labor markets are segmented, and matching takes place independently within each sector, with tightness θ_s, job-finding rate $p(\theta_s)$ and nonemployment $u_s = \delta/(\delta + p(\theta_s))$. Each sector is represented by a continuum of identical atomistic firms. Sickness risk in sector s is

$$\lambda_s(x) = \lambda_{0s} - g_s(x), \tag{28}$$

where λ_{0s} captures exogenous sector-specific sickness risk, and prevention costs $\psi_s(x)$ may differ across sectors. All the previous results hold sector by sector: prevention satisfies $\psi_s'(x_s) = K\, g_s'(x_s)$, wages are determined by Nash bargaining in each sector according to (14), with $p(\theta_s)$ and Ω_s, and tightness in each sector satisfies the job-creation condition (17) with Ω_s. Wages therefore differ across sectors. The payroll contribution rate τ is common to all sectors.

Uniform and sector-relative experience rating. Under *uniform* experience rating, a firm of sector s pays $\kappa c_H \lambda_s(x)$ per employee, and the payroll contribution finances the remaining share of public costs:

$$\tau \sum_s N_s(1-u_s)w_s = (1-\kappa)\, c_H \sum_s N_s(1-u_s)\lambda_s. \tag{29}$$

By Proposition 1, under the Hosios condition, $\kappa = 1$ implements the optimal allocation in every sector. But high-risk sectors then bear the full cost of their exogenous risk, and the implicit transfers across sectors generated by pooled financing disappear. Agents are risk neutral and sectoral risk is deterministic, so these transfers have no insurance value in the model. They are pure redistribution, which a policymaker may nevertheless want to preserve, for instance to avoid concentrating the cost of experience rating on sectors whose risk is largely exogenous.

Under *sector-relative* experience rating, a firm of sector s faces the contribution adjustment

$$\kappa c_H \left(\lambda_s(x) - \bar{\lambda}_s\right), \tag{30}$$

where $\bar{\lambda}_s$ is the average sickness risk among employed workers in sector s, taken as given by atomistic firms. Positive values correspond to surcharges and negative values to rebates. Because firms take $\bar{\lambda}_s$ as given, the prevention condition is the same as under uniform experience rating, $\psi_s'(x_s) = (\gamma y + \kappa c_H) g_s'(x_s)$. In equilibrium, firms of a given sector are identical, hence $\lambda_s = \bar{\lambda}_s$ and the adjustment is zero. Surcharges and rebates offset each other within each sector. Sector-relative experience rating therefore does not finance any public cost, and the payroll contribution must finance all of them:

$$\tau \sum_s N_s(1-u_s)w_s = c_H \sum_s N_s(1-u_s)\lambda_s. \tag{31}$$

Proposition 3. *Under sector-relative experience rating with $\kappa = 1$, prevention is optimal in every sector, $x_s = x_s^\star$. Tightness is generally not optimal: the match value contains the payroll contribution only through τb, with $\tau > 0$ given by (31), so that $\Omega_s - \Omega_s^{\mathrm{pl}} = \lambda_s c_H - \tau b$. Under*

the Hosios condition, job creation is excessive in sectors where $\lambda_s c_H > \tau b$ and insufficient in the others. Since $\tau b/c_H = \bar{\lambda}\, b/\bar{w} < \bar{\lambda}$, where $\bar{\lambda}$ and $\bar{w}$ are the employment-weighted average absence rate and wage, job creation is excessive in all sectors whose absence rate exceeds a fraction $b/\bar{w}$ of the average, which includes some low-risk sectors.

Firms bear the full marginal public cost of their absence, which makes prevention optimal. But the payroll contribution still finances all public costs and is largely shifted to wages. Job creation thus remains implicitly subsidized, more in sectors with high absence. This distortion is the price of preserving the transfers across sectors, and Section 5 shows that it is small.

4 Data and calibration

4.1 Data

The empirical analysis is based on the 2019 French Working Conditions Survey (Enquête Conditions de Travail, CT-2019), supervised by the Direction de l'Animation de la Recherche, des Études et des Statistiques (DARES) of the French Ministry of Labor (DARES, 2019). The survey interviews a representative sample of 24,951 workers. It cross-references self-reported health outcomes, such as the number of sick leaves and the number of days of sick leave over the past twelve months, with detailed indicators of the work environment, including physical constraints, psychosocial risks, and organizational safety practices. We restrict the sample to the workers who would be concerned by experience rating of the general sickness insurance scheme. We exclude the 9,215 public-sector employees, whose sick pay is largely borne by their employer (civil servants receive their salary rather than public sickness benefits), and the 2,533 self-employed workers and business owners, who are covered by other schemes and have no employer. Among the remaining 13,203 private-sector employees (employees of firms, associations, private health establishments and private households), we exclude the 184 employees of the agricultural branch, who are covered by the agricultural scheme, and the 637 whose sector is not reported, since part of the analysis is conducted by sector. Dropping the 51 observations for which the number of sick leaves or the survey weight is missing leaves 12,331 private-sector employees. Table 1 describes sickness absence and workplace prevention, and Table OA.1 in the Online Appendix the characteristics of workers and jobs. Descriptive statistics use survey weights; regressions are unweighted.

Measuring workplace prevention. We measure two dimensions of workplace prevention. The first is prevention measures, captured by the five items of the prevention module of the survey that describe them: written safety or health instructions, and, over the past twelve months, safety training provided by the employer, information on occupational risks, a visit of the work unit by the occupational physician, and knowledge of the document written by management that describes the risks of the establishment (the mandatory risk-assessment document, *document unique d'évaluation des risques professionnels*). The second is prevention at the source, measured by low exposure to workplace nuisances: no bad odours, no dirt, adequate sanitary facilities, no fumes or dust, and no handling of dangerous products. Avoiding risks and combating them at the source are among the general principles of prevention in French labor law (Article

L4121-2 of the Labor Code), and these exposures largely depend on the employer, through ventilation, cleaning, sanitary facilities or the substitution of processes. Some exposures, such as infectious risks in health and care occupations, are inherent to the job, and we treat them as part of its baseline risk. For each dimension, the index is the first principal component of the tetrachoric correlation matrix of the items, which explains 55% and 68% of their variance, with Thurstone factor scores rescaled between 0 and 1. Tetrachoric correlations treat each binary item as the discretization of a continuous latent variable. They are better suited to binary data than the Pearson correlations of standard principal component analysis, which understate the correlation between binary items (Kolenikov and Angeles, 2009). The indices are computed on the estimation sample. They have no natural unit, and we report the effects of a change of one standard deviation.

Table 1: Sickness absence and workplace prevention: descriptive statistics

	Mean	S.D.
Sickness absence (past 12 months)		
At least one sick leave	31.7	
Number of sick leaves	0.44	0.75
Days of sick leave	9.58	35.45
Days per sick leave	21.76	
Workplace prevention		
Prevention-measures index	0.35	0.30
Written safety or health instructions	50.0	
Safety training	30.9	
Information on occupational risks	36.5	
Visit by the occupational physician	17.8	
Knowledge of the risk-assessment document	38.0	
Low-exposure index	0.73	0.32
No bad odours	68.5	
No dirt	69.3	
Adequate sanitary facilities	84.7	
No fumes or dust	66.7	
No dangerous products	69.6	

Notes: Private-sector employees, CT-2019 (2019 French Working Conditions Survey; 12,331 observations). S.D.: standard deviation, for continuous variables only. Percentages for binary variables. Sick leaves are reported as 0, 1, 2, or 3 or more (coded 3). Days per sick leave: total days divided by total sick leaves, hence no S.D. Prevention items: past twelve months, except written instructions. Indices: between 0 and 1. Characteristics of workers and jobs: Table OA.1 in the Online Appendix.

4.2 Prevention and sickness absence

Before turning to the calibration, we document that workplace prevention is associated with lower sickness absence in French data (Table 2). We estimate Poisson regressions of the number of days of sick leave and of the number of sick leaves over the past year on both indices,[2] and progressively add controls. Specification (2) adds individual and job characteristics: age and its square, sex, education, living in a couple, having a child under three, occupation, type of

[2]The number of sick leaves is reported as 0, 1, 2, or 3 or more; we code the last category as 3. We use Poisson regressions because both outcomes are counts with many zeros; coefficients are proportional effects, and the estimator remains consistent when the data are not Poisson distributed (Santos Silva and Tenreyro, 2006).

contract, part-time work and tenure in the firm. Specification (3) adds sector fixed effects (sectors of the French classification of activities in 38 sectors, Nomenclature d'Activités Française, NAF38), firm size and region. Specification (4), our preferred one, adds proxies for the baseline risk of the job: physical constraints (standing for long periods, painful postures, painful movements), night work and exposure to infectious risks. We do not control for health status, which is a channel through which prevention affects absence and is determined simultaneously with it.

Table 2: Workplace prevention and sickness absence (Poisson regressions)

	(1)	(2)	(3)	(4)
Number of days of sick leave				
Prevention measures	-0.300^{***}	-0.248^{**}	-0.383^{***}	-0.404^{***}
	(0.108)	(0.118)	(0.123)	(0.122)
Effect of +1 s.d. (%)	−8.6	−7.1	−10.8	−11.3
Low exposure	-0.991^{***}	-0.856^{***}	-0.850^{***}	-0.412^{***}
	(0.110)	(0.102)	(0.113)	(0.122)
Effect of +1 s.d. (%)	−27.0	−23.8	−23.6	−12.2
Number of sick leaves				
Prevention measures	0.019	0.056	−0.066	−0.074
	(0.056)	(0.062)	(0.048)	(0.050)
Effect of +1 s.d. (%)	0.6	1.7	−2.0	−2.2
Low exposure	-0.563^{***}	-0.580^{***}	-0.577^{***}	-0.313^{***}
	(0.071)	(0.076)	(0.068)	(0.063)
Effect of +1 s.d. (%)	−16.3	−16.8	−16.7	−9.4
Age, sex, education, family situation	No	Yes	Yes	Yes
Occupation, contract, part-time, tenure	No	Yes	Yes	Yes
Industry (NAF38), firm size, region	No	No	Yes	Yes
Physical constraints, night work, infectious risks	No	No	No	Yes
Observations	12,331	12,331	12,331	12,331
Pseudo-R^2 (days)	0.026	0.090	0.111	0.127

Notes: Poisson regressions; standard errors clustered by sector (NAF38: French classification of activities in 38 sectors; 37 clusters) in parentheses. $^{***}\,p < 0.01$, $^{**}\,p < 0.05$, $^{*}\,p < 0.1$. Effect of +1 s.d.: $100\,(e^{b\sigma} - 1)$, with $\sigma = 0.30$ (prevention measures) and 0.32 (low exposure). s.d.: standard deviation. Source: CT-2019 (2019 French Working Conditions Survey).

Both dimensions of prevention are associated with fewer days of sick leave. Without controls, a one-standard-deviation increase in the prevention-measures index is associated with 8.6% fewer days of sick leave, and in the low-exposure index with 27% fewer days. The association with prevention measures strengthens once sector, firm size and region are controlled for, consistent with prevention being concentrated in riskier industries. The association with low exposure partly reflects differences in the nature of jobs, and it falls by half once the baseline risks of the job are controlled for. In specification (4), a one-standard-deviation increase is associated with 11% fewer days of sick leave for prevention measures and 12% fewer days for low exposure, both significant at the 1% level. Low exposure is also associated with fewer sick leaves (about 9%), whereas prevention measures are associated with shorter rather than fewer absences. These estimates are conditional correlations, not causal effects. Prevention measures are targeted at risky jobs, which biases their coefficient towards zero if baseline risks are imperfectly controlled for. Conversely, part of the exposure that remains within sectors may be inherent to the job rather than the result of prevention. The indices also measure prevention with error. For these

reasons, the regressions are descriptive and do not enter the calibration, which relies on quasi-experimental estimates from the literature, obtained in another country or in another branch of social insurance (Section 4.4).

4.3 Mapping the model to the data

The quantitative analysis does not require us to specify the prevention technology (g, ψ) or to measure prevention effort, which has no natural unit in the data. It only requires how sickness absence responds to its private cost K, because the match chooses prevention to minimize the cost of absence, $C(K) \equiv \min_x\{K\lambda(x) + \psi(x)\}$. By the envelope theorem, $C'(K) = \lambda(K)$, where $\lambda(K)$ is the absence rate chosen by the match. The response of absence to its private cost therefore also gives the prevention costs incurred to obtain it, $\psi(K) = C(K) - K\lambda(K)$. Intuitively, the match invests in prevention until the last euro spent reduces the expected cost of absence by one euro. A strong response of absence to its cost thus reveals that prevention is cheap, and a weak response that it is expensive. We specify a constant-elasticity schedule,

$$\lambda_s(K) = \lambda_s(K_0)\left(\frac{K}{K_0}\right)^{\varepsilon_K}, \qquad K = \gamma y + \kappa c_H, \tag{32}$$

where $K_0 = \gamma y$ is the private cost of absence under pooled financing, $\lambda_s(K_0)$ the absence rate of sector s under pooled financing, and $\varepsilon_K < 0$ the elasticity of sickness absence with respect to its private cost. When the private cost rises from K_0 to K, prevention costs increase by

$$\psi_s(K) - \psi_s(K_0) = \int_{K_0}^{K} \lambda_s(z)\, dz - \left[K\lambda_s(K) - K_0\lambda_s(K_0)\right] = -\varepsilon_K\, \lambda_s(K_0) K_0\, \frac{(K/K_0)^{1+\varepsilon_K} - 1}{1+\varepsilon_K}. \tag{33}$$

With equations (32) and (33), absence, output, prevention costs, public costs, wages, job creation and welfare can be computed for any degree of experience rating, without specifying the prevention technology. Only the increase in prevention costs matters. Their level under pooled financing is a fixed cost per job, which cannot be distinguished from the cost of capital calibrated below. Sectors share the same elasticity and differ only in their absence rates under pooled financing, which, as in Section 3.3, reflect the nature of their activity. The planner's allocation corresponds to $K = \gamma y + c_H$. The schedule therefore has two inputs: the absence rates under pooled financing, which we measure in the data (Section 4.5), and the elasticity ε_K, which we take from a reform that changed the private cost of absence (Section 4.4).

4.4 The behavioral response

The only behavioral parameter is the elasticity ε_K. Estimating it would require a reform that changes the cost of sickness absence for employers, and France has had no such reform for ordinary sickness absence. We therefore proceed in two steps. We take a benchmark value from a reform implemented in another country, and we then assess the sensitivity of our results to a range of values, drawn from other estimates reported for this reform, from alternative ways of mapping it into the model, and from an estimate for another branch of French social insurance (Section 5.3).

Our benchmark is a 2000 Austrian reform studied by Böheim and Leoni (2020), which

abolished a compulsory insurance that refunded employers for the wages they continue to pay to sick blue-collar workers. The insurance refunded 70% of these wages in firms whose wage bill exceeded that of about ten blue-collar workers, and 100% in smaller firms, and was financed by a uniform employer contribution. The reform thus replaced pooled financing by a charge borne by each firm, as experience rating does in our model. At the mean treatment intensity, it reduced days of sickness absence by 17.5%. Before the reform, the private cost of absence was the output lost net of the refunded wage. Measuring output by value added, in which the gross wage has a share $\omega = 0.48$ (French non-financial corporations in 2019, national accounts of the Institut National de la Statistique et des Études Économiques, INSEE), with a refunded share $\chi = 0.7$, the reform multiplied this cost by $1/(1 - \chi\omega) = 1.51$, which gives

$$\varepsilon_K = \frac{\ln(1 - 0.175)}{\ln 1.51} = -0.47. \tag{34}$$

Several features of the reform suggest that this choice is conservative. The estimated decline averages over all workers of treated firms, including white-collar workers whose absences were not refunded, and the reform also extended sick pay for blue-collar workers. The authors accordingly interpret their estimate as a lower bound (Böheim and Leoni, 2020). Full experience rating raises the private cost of absence by 50%, a shock of the same size as the reform, which limits the extrapolation.

Scenarios. Because the mapping of the reform into the model is uncertain, we report a range of elasticities. The low scenario targets the decline in absence during the first year after the reform, 8.6%, which gives $\varepsilon_K = -0.22$. Alternative mappings give -0.29 (refunded share of 1) and -0.70 (refunded share of 0.5, which accounts for the dilution by white-collar workers). In the Netherlands, the sickness absence rate fell by about 15% in the 1990s, after employers were made liable for sick pay, a decline of the same order as in our benchmark, although this aggregate decline cannot be attributed to employer incentives alone (de Jong and Lindeboom, 2004). The high scenario uses the elasticity of -1.20 estimated by Lengagne (2026) in the French occupational accidents and diseases branch, which relates the number of work-related absence days to the share of benefit expenditures borne by the firm. This elasticity is not directly comparable with ε_K, which relates absence to the whole private cost of absence, and it concerns occupational risks, which are more preventable by employers than ordinary sickness. We use it as a high scenario.

4.5 Calibration

The model is quarterly.

Absence. In the survey, 31.7% of private-sector employees report at least one sick leave over the past year, and 9.6 days of sick leave on average, in 0.44 spells of 21.8 days. The survey interviews people at work, which means that long spells are underrepresented. It implies 8.4 benefit days per employee and year, against 12.2 in administrative data from the Direction de la Recherche, des Études, de l'Évaluation et des Statistiques (DREES, 2024). We scale days of absence by 1.45, which gives an absence rate of $\lambda = 3.8\%$.

Public cost of absence. Sickness benefits replace on average a share $r = 0.31$ of the gross daily wage (€32.6 per benefit day, DREES, 2024, against a gross daily wage of €104.6, INSEE, 2021) and cover a share $\iota = 0.877$ of absence days, after the three-day waiting period. Hence $c_B = r\iota\omega y$, i.e. 13% of the value added lost on a day of absence. Medical costs are those of the sick leave itself (consultations and drugs), $c_M = 0.05\, c_B$. Contributions are lost on the part of the wage that is not paid, and remain due on the complement paid by employers. We use the complement required by law (Article L1226-1 of the Labor Code). After a seven-day waiting period, employees with at least one year of tenure receive 90% of their gross wage for 30 days, then two thirds for 30 days, with longer durations for longer tenures. Applied to the tenure and sick leaves of the survey, it amounts on average to $\xi = 25\%$ of the gross wage per day of absence. With employer and employee contribution rates $t_f = 33.6\%$ and $t_w = 23.8\%$ (INSEE national accounts; INSEE, 2021), and the Contribution Sociale Généralisée and the Contribution pour le Remboursement de la Dette Sociale paid on benefits (legal rates, 6.7%), $c_T = (t_f + t_w)(1-\xi)\,\omega y - 0.067\, c_B$, i.e. 20% of the value added lost, one and a half times sickness benefits. These are largely genuine fiscal costs. Most of these contributions finance benefits that do not depend on contributions paid, such as health care and family benefits, and pension rights are partly maintained during sick leave: each 60 days of benefits validates a quarter for the basic pension, and complementary pension points are granted for absences of more than 60 days. In total, the public cost of absence amounts to €20.4 billion in 2019, of which €12.0 billion of lost contributions, and the payroll contribution that finances it is $\tau = 2.0\%$ of wages.

Labor market and production. We measure the transition rates between employment and nonemployment in the French Labor Force Survey (LFS, 2017Q1–2019Q4, individuals aged 20 to 60; INSEE, 2019): $\delta = 0.0346$ and $p = 0.1154$, which imply an employment rate of 76.9%. We set $\beta = 0.99$, $\eta = \alpha = 0.5$ (Hosios condition) and $b = 0.4$ (Shimer, 2005). The cost of capital, $k = 0.25$, makes the wage, which includes all labor costs other than sickness contributions, reproduce the share of compensation of employees in value added (64.1%). We normalize $y = 1$ and $\theta = 1$, and the vacancy cost reproduces the employment rate. The economy has 37 sectors (the NAF38 sectors, excluding agriculture). Each has its own absence rate under pooled financing, shrunk towards the overall mean for small sectors (empirical Bayes), and the other parameters are common to all sectors. The calibration is exactly identified (Table 3). As an external check, 2.85% of employed workers are absent for sickness during the whole reference week in the Labor Force Survey, between the absence rate of the Working Conditions Survey (2.6%) and ours (3.8%).

5 Results

We now quantify the effects of experience rating in the economy with 37 sectors, first under uniform and then under sector-relative experience rating. Table 4 compares pooled financing ($\kappa = 0$) with full experience rating ($\kappa = 1$) and with two intermediate degrees: experience rating limited to sickness benefits ($\kappa = 0.39$) and $\kappa = 0.5$. We discuss the outcomes in the order of the table: sickness absence, public finances and labor costs, employment and output, and finally welfare, which weighs the value of the days of absence avoided against the additional prevention

Table 3: Calibration

Parameter	Description	Value	Target / source
Fixed parameters			
β	Discount factor	0.99	Standard value
δ	Separation rate	0.0346	Employment to nonemployment, French LFS
η	Matching elasticity	0.50	Standard value
α	Bargaining power	0.50	Hosios condition ($\alpha = \eta$)
ω	Gross wage / value added	0.48	Non-financial corporations, INSEE
χ	Refunded share of wages, Austria	0.70	Refund rate of larger firms, Böheim and Leoni (2020)
b	Home production	0.40	b/y, Shimer (2005)
Calibrated parameters (exactly identified, $\kappa = 0$)			
ε_K	Elasticity of absence to its private cost	-0.470	Austrian reform: $K \times 1.51$, absence days -17.5%
$\lambda(K_0)$	Absence rate (%)	3.81	12.2 benefit days per employee and year
c_B	Sickness benefits	0.1311	$r\,\iota\,\omega\,y$, $r = 0.31$, $\iota = 0.877$
c_M	Medical costs	0.0066	$c_M = 0.05\,c_B$ (tariffs)
c_T	Social contributions lost	0.1975	$(t_f + t_w)(1-\xi)\,\omega\,y - 0.067\,c_B$, legal employer complement $\xi = 0.252$
γ	Share of output lost, net of transfers	0.6714	$\gamma y + c_B + c_T = y$
μ	Matching efficiency	0.115	Nonemployment to employment 0.115 (French LFS), $\theta = 1$
k	Cost of capital per job	0.252	Compensation of employees: 64.1% of value added (INSEE)
c_v	Vacancy cost	0.177	Employment rate: 76.9%
Implications of the calibration			
Private cost of absence, $\kappa = 1$ vs $\kappa = 0$		1.50	$(\gamma y + c_H)/\gamma y$
Payroll contribution τ at $\kappa = 0$ (%)		1.99	
Range of sectoral absence rates $\lambda_s(K_0)$ (%)		[1.79, 6.02]	37 sectors
External moment (not targeted)			
Absence rate, LFS (%)		2.85	Employed absent for sickness in reference week

Notes: Quarterly model with 37 sectors. Benefit days per employee and the average daily benefit (r) are from DREES (2024). DREES: statistical directorate of the French Ministry of Health. INSEE: French National Institute of Statistics and Economic Studies. LFS: French Labor Force Survey.

costs.

5.1 Uniform experience rating

Sickness absence and prevention. Full experience rating raises the private cost of absence by 50%. Firms and workers invest more in prevention, and the absence rate falls from 3.81% to 3.14%, i.e. by 17% (Table 4). This decline is close to the Austrian estimate by construction, since the two shocks are of the same size.

Public finances and labor costs. The payroll contribution disappears, and each firm pays the public cost of its own workers' absence. As absence declines, this cost falls by 17%: firms pay €16.8 billion per year instead of €20.4 billion. Only firms whose absence remained above the current average, which are concentrated in high-risk sectors, would pay more. The lower charge is largely passed on to wages through bargaining: wages rise by 0.27%, so that labor costs per employee are almost unchanged (-0.07%). Firms also bear additional prevention costs (€8.7 billion per year), but these are more than offset by fewer days of absence (€10.6 billion).

Employment and output. Output rises by 0.51%, as fewer working days are lost, and the employment rate falls slightly, from 76.93% to 76.80%. This small decline is efficient. Under pooled financing, the payroll contribution is largely shifted to wages, so that firms do not bear the public cost generated by the jobs they create, and job creation is excessive (Section 3.1). Experience rating ends this implicit subsidy, and tightness falls to its optimal level ($\theta^{\mathrm{ER}} = \theta^{\mathrm{pl}} = 0.985$), as predicted by Proposition 1. Experience rating does not destroy jobs beyond this

Table 4: Effects of experience rating

	Pooled	Uniform			Sector-relative		
	$\kappa = 0$	$\kappa = 0.39$	0.5	1	0.39	0.5	1
Sickness absence							
Private cost of absence, K/K_0	1.00	1.20	1.25	1.50	1.20	1.25	1.50
Absence rate (%)	3.81	3.50	3.43	3.14	3.50	3.43	3.15
Change (%)		−8.1	−10.0	−17.4	−8.0	−9.9	−17.3
Public finances and labor costs							
Public cost, paid by firms (€ bn)	20.4	18.7	18.3	16.8	18.8	18.4	16.9
Payroll contribution rate, τ (%)	1.99	1.11	0.89	0.00	1.83	1.79	1.64
Wage, change (%)		0.16	0.19	0.27	0.12	0.14	0.18
Labor cost per employee, change (%)		0.00	−0.01	−0.07	−0.04	−0.06	−0.16
Employment and output							
Tightness, θ	1.000	0.995	0.993	0.985	1.002	1.002	1.002
Employment rate (%)	76.93	76.89	76.87	76.80	76.95	76.95	76.95
Output, change (%)		0.26	0.31	0.51	0.34	0.42	0.70
Welfare							
Value of the days avoided (€ bn)		4.9	6.1	10.6	4.9	6.1	10.6
Additional prevention costs (€ bn)		3.6	4.5	8.7	3.6	4.5	8.7
Net gain (€ bn)		1.3	1.5	1.9	1.3	1.5	1.9
Welfare, change (%)		0.108	0.125	0.157	0.107	0.125	0.156

Notes: Economy with 37 sectors. κ: share of the public cost of absence borne by firms (under sector-relative experience rating, of the marginal public cost); $\kappa = 0.39 = c_B/c_H$ when firms are charged the sickness benefits of their workers only. Changes are relative to pooled financing. Euro amounts: 2019, per year; bn: billion. Additional prevention costs and value of the days avoided (output gained and medical costs saved): at initial employment; net gain: their difference. Uniform: each firm pays a share κ of the public cost of its own workers' absence, and the rest through τ. Sector-relative: rebates and surcharges offset each other within sectors, and τ finances all public costs. Labor cost per employee: wage plus payroll contribution and experience-rated charges. Optimal tightness: 0.985. Welfare: including the transition, in % of the per-period welfare flow (consumption equivalent). At $\kappa = 0.25$ and 0.75, experience rating achieves 50% and 95% of the welfare gain of $\kappa = 1$.

efficient correction.

Welfare. The welfare gain sums up these effects. The days of absence avoided increase output and reduce medical costs by €10.6 billion per year, while the additional prevention costs implied by the absence schedule of Section 4.3 amount to €8.7 billion. The net gain, about €2 billion per year, requires no public spending. Accounting also for the changes in employment and vacancy costs along the transition, welfare rises by 0.16%, where welfare is the discounted sum of output, net of the costs of capital, prevention, medical care and vacancies, plus home production, along the transition from pooled financing. The approximation of Proposition 2 gives 0.19%, slightly more than the exact gain because the response of absence to a large shock is less than proportional. In a one-sector economy calibrated to the same targets, the effects are virtually identical: sectoral heterogeneity matters for the distribution of costs across sectors, not for aggregate outcomes.

Partial experience rating. As predicted by Proposition 2, the gain is concentrated in the first steps of experience rating. When firms bear a quarter, half and three quarters of the public cost, they achieve 50%, 80% and 95% of the welfare gain (Table 4; Figure OA.1 in the Online Appendix shows the same pattern under sector-relative experience rating). This matters for the schemes currently debated in France, which would charge firms the sickness benefits of their workers but not the contributions lost during absence. Sickness benefits represent 39% of the public cost of absence. With $\kappa = 0.39$, sickness absence falls by 8.1%, the payroll contribution falls from 2.0% to 1.1% of wages, and about 70% of the welfare gain of full experience rating is achieved (Table 4).

5.2 Sector-relative experience rating

Uniform experience rating makes high-risk sectors bear the full cost of their exogenous risk. Sector-relative experience rating avoids it by benchmarking each firm against the average of its sector. The two schemes provide the same prevention incentives: sickness absence falls by 17%, at the same additional prevention cost, and the welfare gain is almost the same (0.156%, against 0.157%). The small difference reflects the distortion of job creation by the remaining payroll contribution (Proposition 3). The two schemes differ in who pays for absence and in their effects on employment.

Public finances and labor costs. Rebates and surcharges offset each other within each sector, and the payroll contribution still finances all public costs. As absence declines, these costs fall by 17%, from €20.4 billion to €16.9 billion per year, and the contribution rate required to balance the budget falls from 2.0% to 1.6% of wages. Wages rise by 0.18%, less than the decline in contributions, so that labor costs per employee fall by 0.16%. A firm whose absence is at the average of its sector would pay about a sixth less than under pooled financing, and only firms whose absence clearly exceeded the average of their sector would pay more.

Distribution across sectors. The two schemes distribute public costs differently across sectors (Figure 1, right panel, and Table OA.2 in the Online Appendix). Under pooled financing,

low-risk sectors finance part of the public costs of high-risk sectors, through transfers of 0.14% of output. Uniform experience rating eliminates these transfers, since each job pays for its own absence. Sector-relative experience rating preserves most of them (0.12% of output, the decline reflecting lower absence).

Employment and output. Output rises by 0.70%, and employment does not fall. The employment rate even rises slightly, from 76.93% to 76.95%, because the lower contribution rate reduces labor costs, while jobs still do not bear the public cost of their own absence. Sectoral employment rates are almost unchanged, whereas under uniform experience rating their range widens from 76.4–77.4% to 76.0–77.5% (Figure 1, left panel, and Table OA.2).

Partial experience rating. Limited to sickness benefits, sector-relative experience rating reduces sickness absence by 8.0%, lowers the contribution rate to 1.8% of wages, and still achieves about 70% of the welfare gain.

Sector-relative experience rating thus achieves the same gains as uniform experience rating without reducing employment, and it preserves most of the transfers to high-risk sectors. As it benchmarks firms against their sector, as the occupational accidents and diseases branch does through its collective rates, it is the most natural option for France.

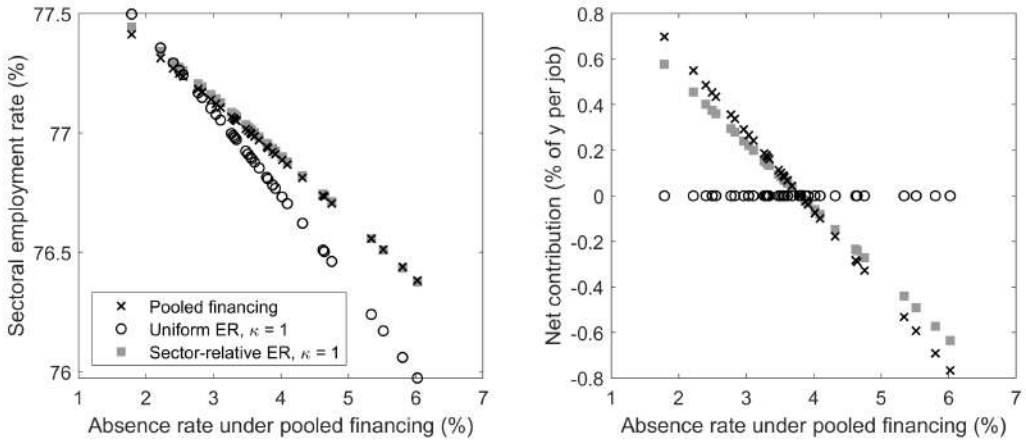


Figure 1: Sectoral outcomes under pooled financing and at $\kappa = 1$. Left: employment rate. Right: net contribution to the financing of the public cost of absence, per job (positive: the sector finances other sectors). Each point is a sector. y: output per job. ER: experience rating.

5.3 Sensitivity analysis

Our results depend on calibration choices. We change them one at a time and recalibrate the model (Table 5). For each variant, we report the public cost of absence under pooled financing, the effects of full sector-relative experience rating on sickness absence, employment and welfare, and the effect of full uniform experience rating on employment. Two choices matter most: the behavioral response and the public cost of absence.

Behavioral response. Across the scenarios of Section 4.4, sickness absence falls by 8.5% to 38.5% and welfare rises by 0.08% to 0.36% (Figure 2; Figure OA.1 in the Online Appendix shows

Table 5: Sensitivity analysis

		Public	Sector-relative			Uniform
	ε_K	cost (€ bn)	Absence (%)	Employment (pp)	Welfare (%)	Employment (pp)
Benchmark	−0.47	20.4	−17.3	0.01	0.156	−0.14
Behavioral response						
First-year effect of the reform (−8.6%)	−0.22	20.4	−8.5	0.01	0.076	−0.16
Refunded share of wages: 1.0	−0.29	20.4	−11.2	0.01	0.100	−0.15
Refunded share of wages: 0.5	−0.70	20.4	−24.7	0.02	0.226	−0.12
High scenario (Lengagne, 2026)	−1.20	20.4	−38.5	0.03	0.363	−0.08
Public cost of absence						
No employer complement	−0.47	24.6	−21.5	0.02	0.240	−0.15
Full wage maintained by employers	−0.47	12.4	−10.1	0.00	0.053	−0.10
No medical costs	−0.47	20.0	−17.1	0.01	0.151	−0.13
Medical costs: 30% of sickness benefits	−0.47	22.4	−18.6	0.02	0.185	−0.14
Absence levels from the survey	−0.47	14.2	−17.3	0.01	0.109	−0.09
Loss of an absence day: labor cost	−0.26	20.4	−17.2	0.03	0.254	−0.21
Labor market						
Home production: $b = 0.3$	−0.47	20.4	−17.3	0.00	0.161	−0.15
Home production: $b = 0.5$	−0.47	20.4	−17.3	0.04	0.152	−0.11
Matching elasticity: $\eta = \alpha = 0.7$	−0.47	20.4	−17.3	0.01	0.158	−0.08

Notes: Each variant is recalibrated. Public cost: public cost of absence under pooled financing, in billion euros (bn), 2019, per year. pp: percentage points. Other columns: changes between $\kappa = 0$ and $\kappa = 1$ in the absence rate, the employment rate and welfare. Benchmark: decline in absence days of 17.5%, refunded share of wages of 0.7, legal employer complement, medical costs equal to 5% of sickness benefits, absence rescaled to administrative data (3.8% instead of 2.6%), loss of an absence day measured by value added, home production $b = 0.4$, matching elasticity $\eta = \alpha = 0.5$.

the effects of partial experience rating in each scenario). The stronger the response of absence to its cost, the larger the gains.

Public cost of absence. The public cost depends on the complement paid by employers. Without any complement, it amounts to €24.6 billion, sickness absence falls by 21.5% and welfare rises by 0.24%. If all employers maintain the full wage, it amounts to €12.4 billion, and the effects fall to 10% and 0.05%. Other choices affect the welfare gain more than the decline in absence. Measuring the loss of an absence day by the labor cost rather than value added, as internal substitution may limit output losses (Hensvik and Rosenqvist, 2019; Grinza and Rycx, 2020), raises the welfare gain to 0.25%, because the public cost then weighs more in the cost of absence. The elasticity is then recalibrated to -0.26, since the Austrian shock depends on the share of the wage in the measure of output. Taking absence levels from the survey lowers it to 0.11%, as the public cost of absence falls to €14.2 billion. Medical costs matter little: the welfare gain ranges from 0.15% without them to 0.19% when they reach 30% of sickness benefits.

Labor market. The labor market parameters play little role: with other values of home production or of the matching elasticity, the welfare gain remains between 0.15% and 0.16%. Under sector-relative experience rating, the employment rate does not fall in any variant, and it rises by at most 0.04 percentage point. Under uniform experience rating, the decline in absence and the welfare gain are almost identical (not reported), and the employment rate falls by 0.1 to 0.2 percentage point (last column of Table 5). These results ignore that sickness may lead to job loss. In the Online Appendix, we show that Proposition 1 extends to this case, provided that separations do not trigger public transfers, and that lower health-related separations could more than offset the small decline in employment under uniform experience rating. In this sense, our results on employment are conservative: by ignoring health-related separations, the model may understate the effects of experience rating on employment. This is consistent with the finding of Lengagne (2026) that experience rating improved the employment of incumbent workers.

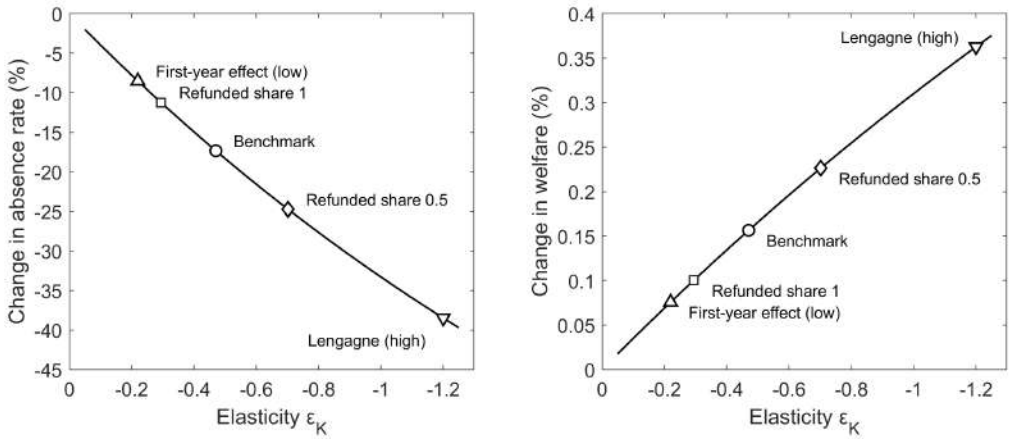


Figure 2: Effects of full sector-relative experience rating as functions of the elasticity ε_K (other parameters recalibrated). Markers: scenarios of Section 4.4. ε_K: elasticity of sickness absence with respect to its private cost.

6 Discussion

Implementing experience rating would raise several issues that the model does not address. We discuss why each of them is unlikely to overturn our conclusions.

Firm size. The model has one job per firm. In practice, the claims of a small firm are too few to be informative, and a single long sick leave would make its contributions volatile. The degree of experience rating would therefore increase with firm size, as in the occupational accidents and diseases branch. This would cost little. Firms that bear half of the public cost already achieve four fifths of the gain (Table 4), and small firms that pay the average rate of their sector keep only the weaker incentives of pooled financing, without affecting those of larger firms.

Long spells. Our elasticity is identified on the first weeks of sickness spells, as the Austrian reform concerned the period during which employers continue to pay wages, four to ten weeks depending on tenure (Böheim and Leoni, 2020). Our results therefore assume that longer spells respond to their cost for employers in the same way. Evidence from the Netherlands, where employers bear the cost of sickness absence for up to two years, is consistent with this assumption. Employer incentives, together with stricter return-to-work requirements, contributed to the decline in sickness absence and in disability insurance enrollment (de Jong and Lindeboom, 2004; Koning and Lindeboom, 2015).

Workers' behavior and monitoring. The model abstracts from workers' moral hazard (Johansson and Palme, 2005; Ziebarth and Karlsson, 2010). This does not affect the externality, because the public cost of an absence is borne whether or not the absence is justified. Firms may also respond to experience rating by monitoring absences rather than by prevention (Böheim and Leoni, 2020). Our elasticity comes from a reform of employers' costs and already includes this response. Only its valuation is uncertain, because monitoring may deter unjustified absences at a low cost, but also justified ones.

Health gains. Welfare ignores the disutility of sickness for workers. Since workers bear it, it is part of the private cost of absence and does not affect the externality. Accounting for it would not change our results much. Full experience rating raises the private cost of absence by almost the same amount as the Austrian reform, about a third of the value added of a job, and the predicted decline in absence remains close to the observed one whatever the level of the private cost. Given this decline, the welfare gain, approximately $\frac{1}{2}(1-u)c_H|\Delta\lambda|$, depends on the public cost of absence and not on the private one.

Risk selection. Experience rating may lead firms to avoid hiring workers with a higher sickness risk, such as older workers, rather than to invest in prevention. We see several reasons why this concern is limited. Employers may not discriminate on the basis of health (Article L1132-1 of the Labor Code) and have no access to the medical information of their employees, which is covered by medical secrecy (Article L1110-4 of the Public Health Code). Selection could only rely on observable characteristics, which contributions can neutralize. Just as sector-relative

experience rating neutralizes the risk of the sector, contributions could be benchmarked against the expected absence of the firm given the age structure and occupations of its workforce. Moreover, firms already have an incentive to avoid workers at risk under pooled financing, because absence reduces output. Experience rating adds a charge $\kappa\lambda_i c_H$ for a worker with absence rate λ_i. The additional incentive is proportional to κ, whereas the gain is a share $2\kappa - \kappa^2$ of the gain of full experience rating. With $\kappa = 1/2$, the additional incentive is halved, while about four fifths of the gain are preserved (Table 4). Finally, experience rating in the occupational accidents and diseases branch improved the employment of incumbent workers, including injured ones (Lengagne, 2026).

7 Conclusion

Pooled financing of the public costs of sickness absence weakens firms' incentives to invest in workplace prevention, because firms and workers do not internalize the public savings that prevention generates. Full experience rating, combined with the Hosios condition, restores efficiency, and sector-relative experience rating achieves almost the same gains while largely preserving the transfers to high-risk sectors.

In France, where the public cost of sickness absence amounts to about €20 billion per year once lost contributions are counted, full experience rating would reduce sickness absence by 17% (8.5% to 38.5% across scenarios) and the resources saved would exceed the additional prevention costs by about €2 billion per year, with negligible effects on employment. As absence declines, the contributions paid by firms fall by 17%. Under sector-relative experience rating, the contribution rate required to balance the budget falls from 2.0% to 1.6% of wages, labor costs fall and employment rises slightly. Charging firms only the sickness benefits of their workers, as currently debated, would already achieve about 70% of this gain, and charging half of the public cost about four fifths. This supports a partial degree of experience rating, increasing with firm size.

Experience rating would not raise aggregate employer contributions. It would make prevention pay.

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Data availability statement

The data that support the findings of this study, the 2019 French Working Conditions Survey and the French Labor Force Survey (2017–2019), are confidential and available to accredited researchers from Quetelet-Progedo Diffusion. The code that reproduces all results is available from the authors upon request.

Appendix A. Wage bargaining and job creation

At the bargaining stage, prevention effort x is taken as given. Under free entry, $V = 0$, and the Nash problem is $\max_w \alpha \ln(W - U) + (1 - \alpha) \ln J$, with first-order condition

$$\alpha \frac{\partial (W - U)/\partial w}{W - U} + (1 - \alpha) \frac{\partial J/\partial w}{J} = 0. \tag{A.1}$$

Subtracting the Bellman equation of nonemployment from that of employment yields

$$W - U = \frac{w - b}{1 - \beta(1 - \delta) + \beta p(\theta)}. \tag{A.2}$$

Since U is treated as parametric during bargaining, $\partial(W - U)/\partial w = \partial W/\partial w = 1/[1 - \beta(1 - \delta)]$. With $V = 0$, $J = [y(1 - \lambda(x)\gamma) - k - \psi(x) - (1 + \tau)w]/[1 - \beta(1 - \delta)]$, so that $\partial J/\partial w = -(1 + \tau)/[1 - \beta(1 - \delta)]$. Substituting into (A.1) gives

$$\alpha J = (1 - \alpha)(1 + \tau)(W - U), \tag{A.3}$$

and, using (A.2),

$$w = b + \frac{\alpha[1 - \beta(1 - \delta) + \beta p(\theta)]}{(1 - \alpha)(1 + \tau)} J. \tag{A.4}$$

Substituting this expression into the value of the job gives

$$J = \frac{(1 - \alpha)\,\Omega(x)}{1 - \beta(1 - \delta) + \alpha\beta p(\theta)}, \qquad \Omega(x) = y(1 - \lambda(x)\gamma) - k - \psi(x) - (1 + \tau)b, \tag{A.5}$$

and therefore the wage (14). Free entry, $c_v/q(\theta) = \beta J$, together with $q(\theta) = p(\theta)/\theta$, yields the job-creation condition (17). With experience rating, Ω is replaced by Ω^{ER} throughout.

Appendix B. Derivation of the optimal allocation

The first-order condition with respect to x is $(1 - u)\,\partial\Omega^{\mathrm{pl}}/\partial x = 0$. Using $\lambda(x) = \lambda_0 - g(x)$, $\partial\Omega^{\mathrm{pl}}/\partial x = \gamma y g'(x) - \psi'(x) + c_H g'(x)$, which gives (21). The first-order condition with respect to θ is $-c_v u + \beta \mathcal{W}'(u')\,\partial u'/\partial\theta = 0$ with $\partial u'/\partial\theta = -u p'(\theta)$, i.e. $c_v = -\beta p'(\theta)\mathcal{W}'(u')$. The envelope condition is

$$\mathcal{W}'(u) = -\Omega^{\mathrm{pl}}(x) - c_v\theta + \beta \mathcal{W}'(u')[1 - \delta - p(\theta)]. \tag{B.1}$$

In a steady state, $\mathcal{W}'(u') = \mathcal{W}'(u) = -[\Omega^{\mathrm{pl}}(x) + c_v\theta]/[1 - \beta(1 - \delta - p(\theta))]$, so that

$$p'(\theta)\,\Omega^{\mathrm{pl}}(x) = c_v \left[\frac{1}{\beta} - (1 - \delta) + p(\theta) - \theta p'(\theta)\right]. \tag{B.2}$$

Since $p(\theta) = \mu\theta^{1-\eta}$, $\theta p'(\theta) = (1 - \eta)p(\theta)$, which gives (22).

Appendix C. Proof of Proposition 1

Under $\kappa = 1$, the prevention condition (25) becomes $\psi'(x^{\mathrm{ER}}) = (\gamma y + c_H) g'(x^{\mathrm{ER}})$, which coincides with (21); hence $x^{\mathrm{ER}} = x^\star$. By (24), $\tau = 0$, so that $\Omega^{\mathrm{ER}}(x^\star) = y(1 - \lambda(x^\star)\gamma) - k - \psi(x^\star) - \lambda(x^\star)c_H - b = \Omega^{\mathrm{pl}}(x^\star)$. The decentralized job-creation condition then differs from (22) only through the replacement of η by α. Under the Hosios condition $\alpha = \eta$, the two conditions coincide, and since the left-hand side decreases and the right-hand side increases with θ, the solution is unique: $\theta^{\mathrm{ER}} = \theta^\star$. The same argument applies sector by sector in the economy of Section 3.3 under uniform experience rating. Under sector-relative experience rating, the prevention condition is unchanged, but $\tau > 0$ by (31), so that $\Omega_s = \Omega_s^{\mathrm{pl}} + \lambda_s c_H - \tau b \neq \Omega_s^{\mathrm{pl}}$ unless $\lambda_s c_H = \tau b$, which proves Proposition 3.

Appendix D. Proof of Proposition 2

Since prevention does not affect the dynamics of nonemployment and tightness does not affect the match value, the planner's objective along a path with constant prevention x and tightness θ, starting from u_0, can be written

$$\mathcal{V}(x, \theta) = \sum_{t \geq 0} \beta^t \Big[(1 - u_t(\theta))\, \Omega^{\mathrm{pl}}(x) + b - c_v \theta u_t(\theta) \Big], \tag{D.1}$$

where $u_t(\theta)$ follows the law of motion of nonemployment. Under experience rating of degree κ, prevention $x(\kappa)$ and tightness $\theta(\kappa)$ jump immediately to their new steady-state values, so that $\mathcal{W}(\kappa) = \mathcal{V}(x(\kappa), \theta(\kappa))$. By Proposition 1, $(x(1), \theta(1)) = (x^\star, \theta^\star)$, which maximizes $\mathcal{V}$.

Second-order expansion. Since $\Omega^{\mathrm{pl}\prime}(x^\star) = 0$, both $\mathcal{V}_x = \sum_t \beta^t (1 - u_t)\, \Omega^{\mathrm{pl}\prime}(x)$ and the cross derivative $\mathcal{V}_{x\theta} = -\sum_t \beta^t u_t'(\theta)\, \Omega^{\mathrm{pl}\prime}(x)$ vanish at $x^\star$. To the second order,

$$\mathcal{V}(x^\star, \theta^\star) - \mathcal{V}(x, \theta) \approx \tfrac{1}{2} |\mathcal{V}_{xx}|\, (x - x^\star)^2 + \tfrac{1}{2} |\mathcal{V}_{\theta\theta}|\, (\theta - \theta^\star)^2. \tag{D.2}$$

Part (i). The second term of (D.2) at $\kappa = 0$ is $\Delta W_\theta / (1 - \beta)$, where $\Delta W_\theta \equiv (1 - \beta)\, \frac{1}{2} |V_{\theta\theta}| (\theta(0) - \theta^\star)^2 \geq 0$ is second order in the distortion of job creation. For the first term, by the prevention condition under pooled financing, $\psi'(x(0)) = \gamma y g'(x(0))$, so that $\Omega^{\mathrm{pl}\prime}(x(0)) = c_H g'(x(0))$, while $\Omega^{\mathrm{pl}\prime}(x^\star) = 0$. Since $\Omega^{\mathrm{pl}\prime}$ is approximately linear between $x(0)$ and $x^\star$, the per-period gain from prevention is

$$(1 - u) \int_{x(0)}^{x^\star} \Omega^{\mathrm{pl}\prime}(z)\, dz \approx \tfrac{1}{2} (1 - u)\, c_H\, g'(x(0))\, (x^\star - x(0)) \approx \tfrac{1}{2} (1 - u)\, c_H\, |\Delta\lambda|, \tag{D.3}$$

where $\Delta\lambda = \lambda(x^\star) - \lambda(x(0))$. By the definition of ε_K, $|\Delta\lambda| \approx \lambda\, |\varepsilon_K|\, c_H / K_0$, since full experience rating raises the private cost of absence from K_0 to $K_0 + c_H$. Discounting the per-period gain, with u evaluated at the pooled-financing steady state, gives the first term of (26).

Part (ii). The private cost of absence, $K(\kappa) = \gamma y + \kappa c_H$, is linear in κ, so that, to the first order, $x(\kappa) - x^\star = (1 - \kappa)\, (x(0) - x^\star)$. Similarly, the distortion of the match value, $\Omega^{\mathrm{ER}} - \Omega^{\mathrm{pl}} =$

$(1-\kappa)\lambda c_H - \tau b$, is proportional to $1-\kappa$ to the first order, since $\tau = (1-\kappa)\lambda c_H/w$ by (24), and the change in Ω^{pl} induced by prevention, $\Omega^{\mathrm{pl}}(x^\star) - \Omega^{\mathrm{pl}}(x(\kappa))$, is second order in $1-\kappa$; hence $\theta(\kappa) - \theta^\star = (1-\kappa)(\theta(0) - \theta^\star)$ to the first order. By (D.2), $\mathcal{W}(1) - \mathcal{W}(\kappa) \approx (1-\kappa)^2[\mathcal{W}(1) - \mathcal{W}(0)]$, which gives (27). □

Online Appendix to "Workplace Prevention, Sickness Absence, and Experience Rating"

Renselgi Kanga Anthony Terriau

November 2026

This Online Appendix reports additional tables and a figure (Section OA.1) and extends the model to health-related separations (Section OA.2). References to equations, propositions, tables and figures without the prefix OA refer to the paper.

OA.1 Additional tables and figure

Table OA.1: Characteristics of workers and jobs

	Mean	S.D.
Age	40.80	11.93
Women	44.2	
Education: two years of higher education or more	41.8	
Living in a couple	71.8	
Child under three	11.2	
Managers and professionals	18.7	
Intermediate occupations	26.2	
Clerical and service workers	26.6	
Blue-collar workers	27.6	
Permanent contract	83.6	
Part-time	16.2	
Tenure in the firm (years)	9.63	9.94
Firm size: 1–49 employees	31.9	
Firm size: 50–499 employees	22.0	
Firm size: 500 employees or more	40.1	
Standing for long periods	46.7	
Painful postures	35.7	
Painful movements	37.4	
Night work	12.8	
Exposure to infectious risks	26.4	

Notes: Private-sector employees, CT-2019 (2019 French Working Conditions Survey; 12,331 observations). S.D.: standard deviation, for continuous variables only. Percentages for binary variables. These variables are the controls of Table 2, together with sector and region. Tenure: the 12,307 employees who report it. Firm size is not reported for 6% of employees.

Table OA.2: Sectoral employment and transfers across sectors

	Employment rate (%)			Transfers
	Lowest sector	Highest sector	Aggregate	(% of Y)
Pooled financing ($\kappa = 0$)	76.4	77.4	76.93	0.14
Uniform experience rating ($\kappa = 1$)	76.0	77.5	76.80	0.00
Sector-relative experience rating ($\kappa = 1$)	76.4	77.4	76.95	0.12

Notes: Benchmark calibration, 37 sectors. Transfers: sum of the positive net contributions of sectors to the financing of the public cost of absence, in % of output.

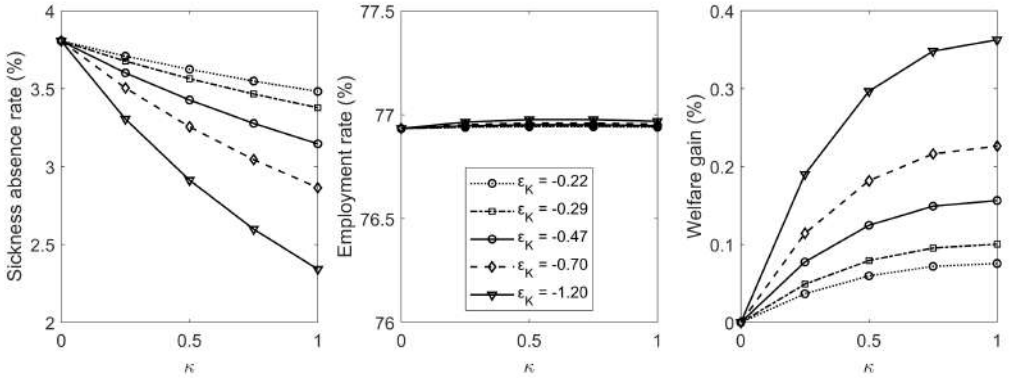


Figure OA.1: Effects of sector-relative experience rating as functions of κ, for the benchmark elasticity and the scenarios of Section 4.4. κ: share of the public cost of absence borne by firms; ε_K: elasticity of sickness absence with respect to its private cost.

OA.2 Health-related separations

Suppose that sickness absence raises the separation rate, $\delta(x) = \delta_0 + \varphi\lambda(x)$ with $\varphi > 0$. If each spell leads to a separation with probability π and lasts d days on average, a worker has $91.25\,\lambda/d$ spells per quarter, so that $\varphi = 91.25\,\pi/d$. All other assumptions are unchanged; in particular, nonemployment entails no public transfer, and we consider full experience rating, $\kappa = 1$, so that $\tau = 0$.

Decentralized equilibrium. With $V = 0$ and $\tau = 0$, the Bellman equations give the surplus $S = (W - U) + J$ of a match:

$$S = \Omega^{\mathrm{pl}}(x) + \beta\big[1 - \delta(x)\big]S - \beta p(\theta)(W - U), \tag{OA.1}$$

where $\Omega^{\mathrm{pl}}(x) = y(1 - \lambda(x)\gamma) - k - \psi(x) - \lambda(x)c_H - b$ is the match value with $\kappa = 1$ and $\tau = 0$. Nash bargaining gives $W - U = \alpha S$, so that, in a steady state,

$$S = \frac{\Omega^{\mathrm{pl}}(x)}{1 - \beta[1 - \delta(x) - \alpha p(\theta)]}. \tag{OA.2}$$

The firm and the worker choose prevention to maximize the surplus, taking the continuation value S as given. Prevention now also raises the probability that the match survives, and the prevention condition becomes

$$\psi'(x) = \big[\gamma y + c_H + \varphi\beta S\big]\, g'(x). \tag{OA.3}$$

Free entry gives $c_v = \beta q(\theta)(1 - \alpha)S$.

Optimal allocation. The planner solves

$$\mathcal{W}(u) = \max_{x,\theta} \Big\{(1 - u)\Omega^{\mathrm{pl}}(x) + b - c_v\theta u + \beta\mathcal{W}(u')\Big\} \quad \text{s.t.} \quad u' = u(1 - p(\theta)) + (1 - u)\delta(x). \tag{OA.4}$$

Let $\Sigma \equiv -\mathcal{W}'(u)$ denote the social value of a match. The first-order conditions with respect to x and θ are

$$\psi'(x) = \big[\gamma y + c_H + \varphi\beta\Sigma'\big]\, g'(x), \qquad c_v = \beta p'(\theta)\Sigma', \tag{OA.5}$$

where Σ' is the social value of a match in the next period. The envelope condition, $\Sigma = \Omega^{\mathrm{pl}}(x) + c_v\theta + \beta[1 - \delta(x) - p(\theta)]\Sigma'$, gives in a steady state

$$\Sigma = \frac{\Omega^{\mathrm{pl}}(x) + c_v\theta}{1 - \beta[1 - \delta(x) - p(\theta)]}. \tag{OA.6}$$

Proposition OA.1. *With health-related separations, full experience rating ($\kappa = 1$) and the Hosios condition ($\alpha = \eta$), the decentralized equilibrium implements the optimal allocation.*

Proof. Since $p(\theta) = \mu\theta^{1-\eta}$, $p'(\theta) = (1 - \eta)q(\theta)$, and the planner's condition for θ reads $c_v = \beta q(\theta)(1 - \eta)\Sigma$. Under $\alpha = \eta$, it coincides with free entry if and only if $S = \Sigma$. Using free entry,

$c_v\theta = \beta p(\theta)(1-\alpha)S$, and (OA.2) can be written

$$S\{1-\beta[1-\delta(x)-p(\theta)]\} = \Omega^{\text{pl}}(x) + \beta p(\theta)(1-\alpha)S = \Omega^{\text{pl}}(x) + c_v\theta, \tag{OA.7}$$

which is (OA.6). Hence, at given (x,θ), the private value of a match equals its social value, $S = \Sigma$. The two prevention conditions then coincide, and so do the job-creation conditions: the conditions that characterize the decentralized equilibrium are those that characterize the optimal allocation. □

As in models of endogenous job destruction (Pissarides, 2000, ch. 8), the Hosios condition aligns the private and social values of a match. The proposition relies on the absence of public transfers to the nonemployed: if separations triggered benefits financed by pooled contributions, experience rating of sickness costs would have to be complemented by a charge on separations, as in Blanchard and Tirole (2008).

Quantitative bound. Since the separation gaps observed in the data are not causal, we do not calibrate this model, but bound the channel. Suppose that each spell leads to a separation with probability π. Full experience rating reduces the absence rate by 0.0066; attributing 41% of this decline to the frequency of spells, as implied by the estimated effects of the Austrian reform on the number and the duration of spells (Böheim and Leoni, 2020), with a mean duration of 32 days per spell, the number of spells falls by 0.0078 per worker and quarter, and the separation rate by $\pi \times 0.0078$. In the French Labor Force Survey, the quarterly separation rate of workers absent for sickness exceeds that of other workers by 3.2 percentage points after an absence of 30 days or less and by 12.7 points after a longer absence. Weighting these gaps by the share of spells of 30 days or less (84%) gives $\pi \approx 0.047$, likely an upper bound, since these gaps also reflect the selection of less healthy workers into separations. Table OA.3 reports the implied change in the employment rate, holding the job-finding rate at its value under full experience rating.

Table OA.3: Bound on health-related separations (one-sector economy, $\kappa = 1$)

π	$\Delta\delta$	Δ employment, channel (pp)	Δ employment, total (pp)
0.047	−0.00037	+0.189	+0.058
0.090	−0.00071	+0.365	+0.234
0.200	−0.00156	+0.814	+0.683

Notes: π: probability that a sickness spell leads to a separation. Channel: change in the employment rate due to lower separations. Total: including the change in employment of the benchmark model (−0.13 pp). pp: percentage points. $\pi = 0.047$: separation gap of workers absent for sickness, by duration of absence, weighted by the share of spells of 30 days or less; $\pi = 0.09$: overall separation gap of workers absent for sickness (French Labor Force Survey 2017–2019); $\pi = 0.20$: illustrative.

With $\pi = 0.047$, lower separations more than offset the small decline in employment of the benchmark model: the employment rate rises by 0.06 percentage point; even with $\pi = 0.20$, it rises by only 0.68 percentage point. Health-related separations would make experience rating slightly favorable to employment, but its effects on employment remain small.

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