

DISCUSSION PAPER SERIES

No. 4031

JOB PROTECTION LAWS AND AGENCY PROBLEMS UNDER ASYMMETRIC INFORMATION

Patrick Schmitz

LABOUR ECONOMICS



Centre for **E**conomic **P**olicy **R**esearch

www.cepr.org

Available online at:

www.cepr.org/pubs/dps/DP4031.asp

JOB PROTECTION LAWS AND AGENCY PROBLEMS UNDER ASYMMETRIC INFORMATION

Patrick Schmitz, University of Bonn and CEPR

Discussion Paper No. 4031
December 2004

Centre for Economic Policy Research
90–98 Goswell Rd, London EC1V 7RR, UK
Tel: (44 20) 7878 2900, Fax: (44 20) 7878 2999
Email: cepr@cepr.org, Website: www.cepr.org

This Discussion Paper is issued under the auspices of the Centre's research programme in **LABOUR ECONOMICS**. Any opinions expressed here are those of the author(s) and not those of the Centre for Economic Policy Research. Research disseminated by CEPR may include views on policy, but the Centre itself takes no institutional policy positions.

The Centre for Economic Policy Research was established in 1983 as a private educational charity, to promote independent analysis and public discussion of open economies and the relations among them. It is pluralist and non-partisan, bringing economic research to bear on the analysis of medium- and long-run policy questions. Institutional (core) finance for the Centre has been provided through major grants from the Economic and Social Research Council, under which an ESRC Resource Centre operates within CEPR; the Esmée Fairbairn Charitable Trust; and the Bank of England. These organizations do not give prior review to the Centre's publications, nor do they necessarily endorse the views expressed therein.

These Discussion Papers often represent preliminary or incomplete work, circulated to encourage discussion and comment. Citation and use of such a paper should take account of its provisional character.

Copyright: Patrick Schmitz

CEPR Discussion Paper No. 4031

December 2004

ABSTRACT

Job Protection Laws and Agency Problems Under Asymmetric Information*

Under symmetric information, a job protection law that says that a principal who has hired an agent today must also employ them tomorrow can only reduce the two parties' total surplus. The law restricts the principal's possibilities to maximize their profit, which equals the total surplus, because they leave no rent to the agent. However, under asymmetric information, a principal must leave a rent to the agent, and hence profit maximization is no longer equivalent to surplus maximization. Therefore, a job protection law can increase the expected total surplus by restricting the principal's possibilities to inefficiently reduce the agent's rent.

JEL Classification: D82, E24, J65 and K31

Keywords: employment protection, job security and labour market rigidities

Patrick Schmitz
Wirtschaftspolitische Abteilung
University of Bonn
Adenauerallee 24-42
D-53113 Bonn
GERMANY
Tel: (49 228) 737937
Fax: (49 228) 739221
Email: patrick.schmitz@wiwi.uni-bonn.de

For further Discussion Papers by this author see:
www.cepr.org/pubs/new-dps/dplist.asp?authorid=149900

*I would like to thank Bert Füssenich, Stephanie Rosenkranz, Urs Schweizer, and Dirk Sliwka for helpful discussions.

Submitted 08 October 2003

1 Introduction

In most European countries, permanent employment relationships that are protected by job security legislation are the regular case. It is quite obvious that job security is a precious good. However, why is the government needed to legislate employment protection? If a permanent relationship between an employer and an employee is beneficial, say because the employee is risk-averse or needs incentives to invest in firm-specific skills, then the two parties could deliberately write a labor contract that guarantees job security to the employee. How can a job protection law increase welfare over and above the level that can be reached by private contracting? After all, it is merely a restriction on the class of contracts that the two parties may write.¹

In general, restrictions on the class of contracts that private parties may write can be desirable in the presence of externalities. For instance, welfare can be increased if cartel contracts are prohibited, because such contracts have negative externalities on the consumers, who are not contractual parties. But why should insecure or fixed-term employment contracts be prohibited? A possible reason is that permanent employment relationships have positive external effects that the contractual parties do not internalize.² However, in what follows I will not consider any such externalities and instead only focus on the gains from trade that accrue to the employer and the employee.

The main result of the analysis will be that state-mandated employment protection can strictly increase the expected surplus that an employer and an employee together can generate. This will be demonstrated in a simple principal-agent model that does not rely on risk-aversion, incomplete contracts, search frictions, wealth constraints, or limited commitment abilities.

¹In the present paper, job protection legislation means that an employer who hires an employee today is not allowed to dismiss him tomorrow; i.e., the law imposes prohibitive firing costs. This is to be distinguished from severance payments, which in theory can trivially be undone by the parties, as has been discussed by Lazear (1990).

²For instance, more mobility could mean that people care less about their neighbors and imply more criminality. Less job security could negatively affect the housing market and the public health system. Without doubt, job insecurity can be damaging to your health.

Instead, the result will follow immediately from the presence of asymmetric information, which of course is the cornerstone of the principal-agent theory. Under symmetric information, the employer can extract the full gains from trade with the employee. Hence, a law that restricts the class of feasible contracts will reduce not only the employer's profit, but at the same time the total surplus generated in the employment relationship. In contrast, under asymmetric information the employer must leave an information rent to the employee. This means that the employer's profit is no longer equal to the two parties' total surplus. A job protection law may then decrease the employer's profit but simultaneously increase the total surplus, because it limits the possibilities of the employer to inefficiently dismiss the employee in order to reduce the information rent.³

To the best of my knowledge, this is the first paper which argues that mandatory employment protection can be welfare-enhancing in a complete contracting model with rational actors.⁴ This is quite surprising in the light of the prominence that the agency model with asymmetric information has gained in recent years. The most closely related paper I am aware of is Aghion and Hermalin (1990). They consider a signaling model and show that legal restrictions on the class of contracts that the informed party may offer can enhance welfare (by prohibiting inefficient signaling). In contrast, the present paper follows the adverse selection literature and assumes that the principal offers the contract to the privately informed agent.⁵

The remainder of the paper is organized as follows. In the next section,

³It is a standard result that in agency models with asymmetric information the first best is not achieved because the principal implements trade in too few states of the world. This 'downward distortion' for all but the best type is induced because trade is more attractive for a good-type agent who has to be deterred from mimicking a bad type.

⁴See also Levine (1991) and the literature discussed there. He shows that just-cause employment policies can increase welfare in an efficiency wage model in which it is assumed that workers are unable to borrow and incomplete contracting implies the presence of externalities that are not internalized in the absence of governmental intervention.

⁵As is well-known (see Maskin and Tirole, 1990) the analysis of the adverse selection problem would not change if the principal also had private information, given private values and quasi-linear preferences.

some empirical background and a brief literature review regarding employment protection are provided. In section 3, the basic model is introduced. As a benchmark, the case of symmetric information is studied in section 4. The main result is derived in section 5, where the case of asymmetric information is analyzed. Extensions and modifications are briefly discussed in section 6. Concluding remarks follow in section 7. Some technical details have been relegated to the appendix.

2 Job protection: Stylized facts and literature

Detailed information on employment protection legislation in various countries has been collected by the OECD (1999). Table 1 shows the OECD's summary index of several indicators related to the strictness of employment protection legislation, which refer to administrative procedures such as requirements to give reasons for the dismissal, notice of termination, severance payments, unfair dismissal provisions, and restrictions on the use of temporary or fixed-term contracts with specific termination dates. All in all, the countries in southern and continental Europe stand out for having relatively strict employment protection, while at the other extreme, job security regulation is least restrictive in the United States.⁶ However, as has been pointed out by Lazear (1990), even in the U.S. there are institutions such as experienced-rated unemployment insurance that make dismissing an employee costly to the employer.

⁶Note that the overall index hides some variations in the kind of job protection adopted by the different countries. E.g., in Germany and the Netherlands the restrictions on the use of fixed-term contracts are weak, while the protection of regular workers is strong. In contrast, in France and Finland the use of fixed-term contracts is more restricted, while it is easier to dismiss regular workers (see OECD, 1999, p. 57 and p. 63).

Portugal	3.7	Sweden	2.6	Switzerland	1.5
Greece	3.5	Belgium	2.5	Australia	1.2
Italy	3.4	Austria	2.3	Ireland	1.1
Spain	3.1	Japan	2.3	Canada	1.1
France	2.8	Netherlands	2.2	New Zealand	0.9
Germany	2.6	Finland	2.1	United Kingdom	0.9
Norway	2.6	Denmark	1.5	United States	0.7

Table 1. Overall strictness of employment protection legislation in the late 1990s in selected countries (0 = least restrictive, 6 = most restrictive). Source: OECD (1999, p. 66).

It should be emphasized that important aspects of job security provisions such as the willingness of courts to entertain appeals by dismissed employees are difficult to quantify, as has been argued by Bertola (1999). In particular, in Japan the guarantee of job security has been built up by court decisions. According to Schregle (1993), the high degree of job security in Japan goes far beyond the dismissal protection in most Western countries, since for all practical purposes courts deny the validity of dismissal unless the employee has committed a serious misconduct.⁷ In contrast, Kuhn (1993) argues that in Canada civil suits typically entail substantial fixed costs and wrongful dismissal awards depend on one’s earnings, so that pursuing suits is practical only for employees with high earnings.

Most studies on employment protection are focused on the issue of unemployment. Many politicians and journalists seem to believe that we need more mobility and flexibility on the labor market, whereas strict labor standards and employment protection are necessarily bad. When hiring a worker becomes something like an irreversible decision, so the argument goes, then the incentives to create new jobs are reduced, and the clear result is inefficiently high unemployment. While this line of reasoning is popular in political

⁷Schregle (1993) also points out that in Japan temporary employees have been called “second-class citizens” compared with regular employees. This seems to be a good description of how employees with fixed-term contracts might feel in other countries, too.

talkshows, quite a different picture emerges when we look at the scientific evidence. The effect of employment protection on the unemployment rate turns out to be both theoretically and empirically ambiguous. This is not really surprising, because employment protection tends to reduce both the flow into unemployment and the flow into work. The overall impact seems to be small.

Bertola (1990) finds that job security legislation does not appreciably affect long-run unemployment levels. Lazear (1990) finds some evidence of a positive relationship between severance pay and unemployment, while Addison and Grosso (1996) find no such evidence with a more precise set of data. Leonard and Schettkat (1991) conclude that labor market rigidities do not account for differences in job creation in the U.S. and Germany. Comparing the U.S. and Portugal, Blanchard and Portugal (2001) find that employment protection has an ambiguous effect on unemployment.⁸ Buechtemann (1989) reports results for the case of West Germany, where the government in 1985 introduced new legislation facilitating the conclusion of temporary employment contracts. The impact on firms' employment decisions was rather modest and counterbalanced by unintended substitution effects. Buechtemann (1989) concludes that less employment protection is unlikely to lead to more jobs.⁹ In surveys of the empirical evidence, Nickell (1997) and Nickell and Layard (1999) come to the conclusion that strict employment protection legislation and general legislation on labor market standards do not have serious implications for the average level of unemployment.¹⁰

In an early theoretical model, Bentolila and Bertola (1990) found that

⁸Interestingly, even though Portugal and the U.S. are the countries at the top and at the bottom of Table 1, they had almost the same average unemployment rate in the 1990s.

⁹See also Blanchard and Landier (2002), who show that allowing firms to hire workers on fixed-term contracts may lead to higher, not lower, unemployment. They find that the introduction of fixed-term contracts in France in the early 1980s had negative welfare effects.

¹⁰While the OECD's Job Study (1994) encouraged relaxations of employment protection, more recently the OECD (1999) also concluded that stricter employment protection has little or no effect on overall unemployment (and it may reduce unemployment of prime-age men).

a dismissal cost may increase average employment. Hopenhayn and Rogerson (1993) obtained the opposite prediction. More recently, Alvarez and Veracierto (2001) have extended their model and found that severance payments decrease the unemployment rate and increases welfare in the presence of search frictions, risk-averse agents, and the absence of insurance contracts. An important assumption in their paper is that only a particular class of labor contracts is allowed, which precludes agents from obtaining insurance from their employers. In the model of Blanchard and Portugal (2001), the effect of employment protection on unemployment is ambiguous, while the welfare effect is negative.¹¹ Pissarides (2001) has recently pointed out that the analysis of employment protection has been mostly conducted within a framework that cannot justify its existence. In a model with risk-averse workers, he gives an insurance role to employment protection. However, in his model there would be no need for employment protection in the presence of optimal unemployment insurance. Moreover, Pissarides (2001, p. 156) asks but does not further investigate the important question: “Why should the government be needed to legislate employment protection measures and not leave it to private contracts?” This puzzle motivates the present contribution, where no ad hoc restrictions are imposed on private contracting.

3 The basic model

Consider a risk-neutral principal (employer), who has to decide whether or not to hire a risk-neutral agent (employee). Let the agent’s per-period (opportunity) cost of working for the principal be given by his type c , which is distributed on the unit interval according to the cumulative distribution function $F(c)$. There are two periods, $i \in \{1, 2\}$. Let $x_i \in \{0, 1\}$ indicate whether the agent has the job in period i , so that the agent’s overall payoff is given by $v_A(c) = x_1(w_1 - c) + x_2(w_2 - c)$, where w_i denotes the wage

¹¹See also the model of Saint-Paul (2002), where due to international specialization a country may gain by increasing employment protection, even though the total welfare is reduced.

It should be emphasized that in scenario I the class of feasible contracts will not be restricted.¹⁵ In particular, the principal can commit to permanently employ the agent, even in the absence of job protection legislation. Thus, if it turns out that the expected surplus in scenario II can be strictly larger than in scenario I, then this is indeed due to the fact that employment protection is mandatory.

4 Symmetric information

In this section it is assumed that the principal and the agent are symmetrically informed; i.e., both parties know the realization of the agent's type c at date 0. Hence, the principal will not leave a rent to the agent. If the principal employs the agent in a given period, she can just reimburse his costs by setting the wage in this period equal to c .¹⁶

Scenario I. Since the agent's rent is zero, the principal's payoff $v_P(\lambda)$ equals the total surplus $s(\lambda, c)$. In the absence of a job protection law, the principal is free to choose x_1 and $x_2(\lambda)$ in order to maximize $s(\lambda, c)$. Thus, she will make the first-best decisions x_1^{FB} and $x_2^{FB}(\lambda)$. As a consequence, under symmetric information (SI) the principal's ex ante expected payoff in scenario I equals the expected first-best surplus, $S_{SI}^I = S^{FB}$.

Scenario II. In the presence of a job protection law, the principal still wants to maximize the surplus $s(\lambda, c)$, but now she must comply with the job protection constraint $x_2(\lambda) \geq x_1$. Since it is never in the principal's interest to set $x_2(\lambda) > x_1$, the constraint implies that the principal will either employ the agent in both periods or not at all. If she employs the agent, her expected

constitutional stage still being unaware of their future role (principal or agent), they would unanimously favor the scenario which leads to a larger expected surplus. See also Schweizer (1990).

¹⁵As has been mentioned above, it is already known that employment protection can be welfare enhancing if private contracts are by assumption incomplete. In contrast, the present contribution allows complete contracting in the sense of Tirole (1999).

¹⁶Following the usual convention, it is assumed that the agent will work for the principal if he is indifferent between $x_i = 0$ and $x_i = 1$.

payoff is $b - c + E_\lambda[\lambda b - c]$, otherwise it is zero.¹⁷ Hence, she will choose $x_1 = x_2(\lambda) = \mathbb{I}\{2c \leq (1 + E\lambda)b\}$. As a result, the ex ante expected surplus is $S_{SI}^{II} = E \max\{(1 + E\lambda)b - 2c, 0\}$.

The insights of this section can be summarized as follows.

Proposition 1 *If the agent's type c is symmetric information, the first best will be achieved in the absence of a job protection law. Hence, a job protection law can never increase the expected surplus: $S_{SI}^{II} \leq S_{SI}^I$. Moreover, there are cases in which $S_{SI}^{II} < S_{SI}^I$, because the employment decisions given a job protection law are different from the first-best decisions.*

Proof. It has already been argued that the first best is achieved in scenario I. Inspection of x_1 and $x_2(\lambda)$ in the two scenarios immediately shows that due to the law, in scenario II too few types in comparison with the first best may be employed. It is also possible that in scenario II too many types are employed in the second period.¹⁸ Thus, the total surplus can in fact be strictly smaller in scenario II than in scenario I. ■

Since a job protection law imposes an additional constraint on the principal, it can only reduce her profit. Moreover, since under symmetric information the principal's profit equals the total surplus (because she leaves no rent to the agent), this implies that a job protection law can only reduce the surplus. However, the following section shows that these simple results are no longer true in the presence of asymmetric information.

5 Asymmetric information

Now suppose that only the agent himself knows the realization of his type c , while the principal merely knows its distribution. Following most models

¹⁷Throughout, E denotes the expectation operator with respect to all random variables following E , while E_λ denotes the expectation operator with respect to λ only.

¹⁸In other words, employment protection legislation can increase the fraction of unemployed types in period 1, but it can also decrease the fraction of unemployed types in period 2. The average effect is ambiguous, which is well in line with the results of the literature discussed in section 2.

of the adverse selection literature, it will be assumed that $c + F(c)/f(c)$ is increasing in c , where $f(c)$ denotes the density function.¹⁹ When the principal offers a contract to the agent at date 0, she will now have to leave an information rent to the agent. As a consequence, the principal's profit will no longer be equal to the total surplus, which means that the effects of a job protection law on the total surplus are no longer obvious.

Scenario I. Consider first the principal's problem in the absence of a job protection law. In accordance with most papers on adverse selection, it is assumed that the principal can commit to a general mechanism.²⁰ According to the revelation principle (see e.g. Myerson, 1982), it is without loss of generality to confine the analysis to direct revelation mechanisms $[x_1(c), x_2(\lambda, c), w_1(c), w_2(\lambda, c)]$, where $x_1(c) \in [0, 1]$ denotes the probability that the agent is employed in the first period if he claims to be of type c , and similarly $x_2(\lambda, c) \in [0, 1]$ denotes the probability that he is employed in the second period.²¹ The incentive compatibility constraints are

$$\begin{aligned} U(c) &= E_\lambda [x_1(c) [w_1(c) - c] + x_2(\lambda, c) [w_2(\lambda, c) - c]] \\ &\geq E_\lambda [x_1(\tilde{c}) [w_1(\tilde{c}) - c] + x_2(\lambda, \tilde{c}) [w_2(\lambda, \tilde{c}) - c]] \quad \forall c, \tilde{c}. \end{aligned}$$

In words, if c is the agent's true type, then his expected payoff when he is truthful must at least be as large as his expected payoff when he mimics another type \tilde{c} . The agent's participation constraints are given by

$$U(c) \geq 0 \quad \forall c.$$

¹⁹This corresponds to Myerson's (1981) 'regular case' and is implied by the well-known monotone hazard rate property which says that $F(c)/f(c)$ is increasing. Many distribution functions including, of course, the uniform distribution satisfy this property.

²⁰In the literature on incomplete contracting (cf. Hart, 1995), it is often assumed that commitment abilities are limited. Maskin and Tirole (1999) have recently argued that this assumption may be hard to reconcile with a framework that otherwise presumes perfect rationality. (See also Schmitz, 2002b, and the literature discussed there.)

²¹Note that in the solution to the principal's problem, x_1 and x_2 will either be 0 or 1, i.e. no randomization will actually occur. The fact that payments are only made if the agent is employed and that randomized payments are not considered is w.l.o.g. due to risk-neutrality. Negative payments are not ruled out, but they will never be needed.

It is hence assumed that the agent can commit to stay with the firm in the second period.²² In fact, it will however turn out that the principal's optimal contract always allows enough leeway to choose the actual wage payments such that even the per-period participation constraints

$$x_1(c)[w_1(c) - c] \geq 0 \quad \text{and} \quad x_2(\lambda, c)[w_2(\lambda, c) - c] \geq 0 \quad \forall c$$

can be satisfied without imposing additional costs on the principal.

The following technical result provides a very convenient characterization of the incentive compatibility constraints.

Lemma 1 *The mechanism $[x_1(c), x_2(\lambda, c), w_1(c), w_2(\lambda, c)]$ is incentive compatible if and only if (a) $E_\lambda [x_1(c) + x_2(\lambda, c)]$ is weakly decreasing in c and (b) the agent's expected payoff satisfies $U(c) = U(1) + \int_c^1 E_\lambda [x_1(\check{c}) + x_2(\lambda, \check{c})] d\check{c}$.*

Proof. The Lemma is a straightforward application of standard mechanism design techniques (see e.g. Myerson, 1981) and is proved in the appendix. ■

The principal will offer the agent a contract in order to maximize her expected profit, taking the agent's participation and incentive compatibility constraints into account. The following Proposition characterizes the solution of the principal's problem.

Proposition 2 *Under asymmetric information, it is optimal for the principal to offer the following contract in the absence of a job protection law: $x_1(c) = \mathbb{I}\{c + F(c)/f(c) \leq b\}$, $x_2(\lambda, c) = \mathbb{I}\{c + F(c)/f(c) \leq \lambda b\}$, $w_1(c) = c + \int_c^1 x_1(\check{c})d\check{c}$, and $w_2(\lambda, c) = c + \int_c^1 x_2(\lambda, \check{c})d\check{c}$.*

Proof. The principal's expected profit is given by the expected total surplus minus the expected rent of the agent,

$$E [x_1(c)(b - c) + x_2(\lambda, c)(\lambda b - c)] - E [U(c)]$$

²²Recall that it is the aim of the analysis to demonstrate that mandatory job security can be welfare enhancing even in a complete contracting world. It might in practice be illegal for a worker to agree to stay with a firm. Yet, if this were assumed from the outset, the results could only show that labor security laws might undo the effects of other potentially inefficient laws.

$$\begin{aligned}
&= \int_0^1 E_\lambda [x_1(c)(b-c) + x_2(\lambda, c)(\lambda b - c)] f(c)dc \\
&\quad - \int_0^1 \left[U(1) + \int_c^1 E_\lambda [x_1(\check{c}) + x_2(\lambda, \check{c})] d\check{c} \right] f(c)dc,
\end{aligned}$$

where Lemma 1 has been used. Since $U(c)$ is decreasing in c by Lemma 1, the principal will choose the wage payments such that $U(1) = 0$ (i.e., the agent's participation constraint is binding for the worst type). Hence, with the help of partial integration her expected profit can be written as

$$\begin{aligned}
&\int_0^1 E_\lambda [x_1(c)(b-c) + x_2(\lambda, c)(\lambda b - c)] f(c)dc \\
&\quad - \int_0^1 E_\lambda [x_1(c) + x_2(\lambda, c)] F(c)dc \\
&= \int_0^1 E_\lambda \left[x_1(c)(b-c) + x_2(\lambda, c)(\lambda b - c) - [x_1(c) + x_2(\lambda, c)] \frac{F(c)}{f(c)} \right] f(c)dc \\
&= \int_0^1 E_\lambda \left[x_1(c) \left(b - c - \frac{F(c)}{f(c)} \right) + x_2(\lambda, c) \left(\lambda b - c - \frac{F(c)}{f(c)} \right) \right] f(c)dc.
\end{aligned}$$

It is straightforward to see that this expression is maximized by the employment decisions given in the Proposition. Note that since $c + F(c)/f(c)$ is increasing in c , the optimal decisions x_1 and x_2 are weakly decreasing in c , and hence the constraint that $E_\lambda [x_1(c) + x_2(\lambda, c)]$ must be weakly decreasing in c is satisfied. Finally, only the expected total payment from the principal to the agent is uniquely determined. It is straightforward to check that the actual wages can be chosen as stated in the proposition, so that the conditions $U(1) = 0$ (due to the agent's participation constraint) and $U(c) = \int_c^1 E_\lambda [x_1(\check{c}) + x_2(\lambda, \check{c})] d\check{c}$ (due to incentive compatibility) are satisfied. Moreover, the fact that only the expected total payment is determined has been exploited in order to choose the actual wages such that even the per-period participation constraints $x_1(c)[w_1(c) - c] \geq 0$ and $x_2(\lambda, c)[w_2(\lambda, c) - c] \geq 0$ are satisfied. ■

Note that if an agent who is not of the worst type ($c = 1$) is employed, his wage payment will be larger than c , so that he will enjoy a rent. Due to the fact that the agent is privately informed, the principal can no longer extract the total surplus. Moreover, note that as a result the employment decisions

x_1 and x_2 do not generally coincide with the first-best decisions characterized in section 2. Specifically, since $F(c)/f(c) > 0$ for $c > 0$, the agent will not be employed in some states of the world when he would be employed in the first-best solution.

Scenario II. Now consider the principal's problem in the presence of a job protection law. The law restricts the class of feasible mechanisms by imposing the additional constraint $x_2 \geq x_1$. It is obvious to see from the solution derived in scenario I that the principal never wants to set $x_2 > x_1$. Hence, the principal's problem is identical to the problem in scenario I with the additional constraint $x_2(\lambda, c) \equiv x_1(c)$. The solution can be characterized as follows.

Proposition 3 *Under asymmetric information, it is optimal for the principal to offer the following contract in the presence of a job protection law: $x_1(c) = x_2(\lambda, c) = \mathbb{I}\{c + F(c)/f(c) \leq (1 + E\lambda)b/2\}$, $w_1(c) = w_2(\lambda, c) = c + \int_c^1 x_1(\check{c})d\check{c}$.*

Proof. Arguments similar to the ones in scenario I show that the principal's expected profit can be written as

$$\begin{aligned} & \int_0^1 E_\lambda \left[x_1(c) \left(b - c - \frac{F(c)}{f(c)} \right) + x_2(\lambda, c) \left(\lambda b - c - \frac{F(c)}{f(c)} \right) \right] f(c)dc \\ &= \int_0^1 E_\lambda \left[x_1(c) \left((1 + \lambda)b - 2c - 2\frac{F(c)}{f(c)} \right) \right] f(c)dc, \end{aligned}$$

where the constraint $x_1(c) \equiv x_2(\lambda, c)$ has been used. This immediately leads to the employment decision as characterized in the Proposition. The wage payment can also be derived in analogy to scenario I. ■

As might have been expected, the principal employs the agent in fewer states of the world than in scenario II under symmetric information. However, what is more interesting is the comparison between scenarios I and II under asymmetric information. On the one hand, inspection of Propositions 2 and 3 reveals that in the first period the agent may be less often hired if there is a job protection law. But on the other hand, the agent may also be more often employed in the second period. Under symmetric information,

this was clearly bad news, because then the principal only had an incentive to dismiss the agent when this was in fact the first-best decision. But under asymmetric information, the principal will sometimes want to dismiss the agent when it is not first-best, just in order to reduce the agent's rent. Hence, the expected surplus may well be increased by a job protection law.

Formally, under asymmetric information the expected total surplus in scenario I is given by

$$S_{AI}^I = E \left[(b - c) \mathbb{I}\left\{c + \frac{F(c)}{f(c)} \leq b\right\} + (\lambda b - c) \mathbb{I}\left\{c + \frac{F(c)}{f(c)} \leq \lambda b\right\} \right],$$

while the expected total surplus in scenario II can be written as

$$S_{AI}^{II} = E \left[\left((1 + \lambda)b - 2c \right) \mathbb{I}\left\{c + \frac{F(c)}{f(c)} \leq \frac{(1 + E\lambda)b}{2}\right\} \right].$$

It is straightforward to see that asymmetric information reduces the surplus in both scenarios, $S_{AI}^I \leq S_{SI}^I$ and $S_{AI}^{II} \leq S_{SI}^{II}$.

Note that $S_{AI}^{II} = S_{AI}^I$ if $\lambda \equiv 1$. If it is sure that there will be no shock, the principal will never want to dismiss the agent in period 2 if she hired him in period 1, so that a job protection law simply has no effect at all. Moreover, note that $\lambda \equiv 0$ obviously implies $S_{AI}^{II} < S_{AI}^I$. This is intuitively clear, because when the shock will be so severe that it is always efficient to dismiss the agent after period 1, a job protection law can only be harmful. However, in general the sign of $S_{AI}^{II} - S_{AI}^I$ is ambiguous. In particular, it is not difficult to find situations where $S_{AI}^{II} > S_{AI}^I$, so that a job protection law is desirable from an ex ante point of view.

Proposition 4 *Under asymmetric information, it is no longer the case that mandatory job protection can only decrease the expected surplus. If reducing the agent's information rent is sufficiently important for the principal, the expected surplus can be strictly larger in the presence of a job protection law, $S_{AI}^{II} > S_{AI}^I$.*

Proof. It has already been shown that a job protection law cannot increase the expected total surplus if the principal does not have to leave an information rent to the agent. In order to show how this result may change when

the agent enjoys an information rent, it is sufficient to consider a specific example. As an illustration, let $F(c)$ be the uniform distribution and assume that with equal probability there is either no shock or a shock with $\lambda = .4$. Note that the principal wants to employ the agent in any case if λb is always larger than $c + F(c)/f(c)$. In the present example, this means that there is no difference between the two scenarios if $.4b \geq 1 + F(1)/f(1) = 2$, or $b \geq 5$. Otherwise, the expected total surplus in the absence of a job protection law is given by

$$\begin{aligned} S_{AI}^I &= \int_0^1 (b - c)dc + .5 \int_0^1 (b - c)dc + .5 \int_0^{.2b} (.4b - c)dc \\ &= 1.5b - .75 + .03b^2, \end{aligned}$$

while in the presence of the law it is given by

$$\begin{aligned} S_{AI}^{II} &= \int_0^{\min\{1, 1.7b/4\}} (1.7b - 2c)dc \\ &= 1.7b \min\{1, .425b\} - (\min\{1, .425b\})^2. \end{aligned}$$

In Figure 2, the dashed line depicts the surplus in scenario I as a function of b , while the solid line shows the surplus in scenario II. As a benchmark, the first-best surplus is illustrated by the dotted line.

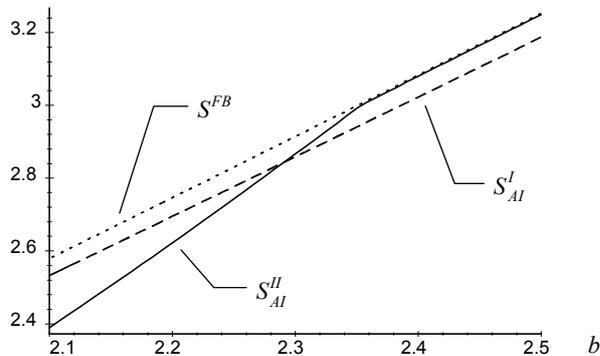


Figure 2. A simple example.

The figure clearly shows that under asymmetric information for sufficiently large values of b , the surplus in the presence of mandatory job protection is strictly larger than the surplus in the absence of the law. ■

Hence, the main result is that job security legislation can increase the expected total surplus of the principal and the agent if the agent enjoys sufficiently large rents due to relevant information that the principal cannot find out. The model thus predicts that job security legislation should be more frequently observed when the principal's possibilities to investigate the agent's type are limited. For instance, several authors have pointed out that privacy rights and data protection are weaker in the U.S. than in Europe.²³ In the light of the model, given this stylized fact, employment protection could indeed be less advantageous in the U.S., which is consistent with the empirical observation reported in section 2.

6 Discussion

Complete contracting. Recall that it has been deliberately assumed that in scenario I the principal could commit to any contract.²⁴ In particular, the principal had the possibility to voluntarily offer the agent a secure job; i.e., she could replicate everything that is possible in scenario II. The fact that the expected total surplus can nevertheless be strictly larger in scenario II than in scenario I thus shows that the government is actually needed to legislate employment protection. While job security might decrease the principal's payoff by an amount that is smaller than the gain of the agent, the principal cannot always make the agent pay for his job security, because the agent's

²³On privacy rights and data protection, see e.g. Pincus and Trotter (1995), Plá Rodríguez (1995), Linowes and Spencer (1996), and Pincus and Johns (1997). When an individual applies for work, he must supply information about himself, which may be supplemented and verified by psychological tests, medical examinations, and background investigations. Note that even in the U.S., the Employee Polygraph Protection Act of 1988 prohibits private employers to request lie detector tests from job applicants (with some exemptions).

²⁴As has been pointed out by Maskin and Tirole (1999), in a complete contracting framework with rational players it is consistent to assume commitment. If the ability to commit were instead restricted in an ad-hoc fashion (as is done in the incomplete contracting literature), the point made in favor of mandatory job protection would be less interesting, because private contracting would be arbitrarily handicapped.

willingness-to-pay depends on his private information. For this reason, state-mandated employment protection can raise the two parties' total welfare over and above the level that can be reached by private contracting.

Unemployment benefits. So far, it has been assumed that the only potential role of the government is to enforce job security. Let us now briefly consider how the analysis of the principal-agent relationship would change if the government paid an amount $u \geq 0$ to the agent in every period in which he is unemployed, financed by taxing the principal.²⁵ It is straightforward to see that such a policy would simply be an otherwise neutral redistribution from the principal to the agent if the tax and transfer system worked without frictions. In other words, the expected total surplus could still be increased by mandatory job protection in the cases identified in the preceding analysis.

However, the analysis would change if there were shadow costs of public funds, so that when the government wants to pay u to the agent, it must make the principal pay an amount ζu , where $\zeta \geq 1$. Since the amount $(\zeta - 1)u$ is a social loss, it is now first-best to employ the agent in the first period whenever $b - c \geq -(\zeta - 1)u$ and in the second period whenever $\lambda b - c \geq -(\zeta - 1)u$, given that the unemployment benefit $u \geq 0$ is exogenously imposed.²⁶ Adapting the preceding analysis, it is straightforward to see that now the expected total surplus in the absence of mandatory job protection is

$$S_{AI}^I = E \left[(b - c + (\zeta - 1)u) \mathbb{I}\left\{c + \frac{F(c)}{f(c)} \leq b + (\zeta - 1)u\right\} + (\lambda b - c + (\zeta - 1)u) \mathbb{I}\left\{c + \frac{F(c)}{f(c)} \leq \lambda b + (\zeta - 1)u\right\} \right],$$

while in the presence of a job protection law it is

$$S_{AI}^{II} = E \left[((1 + \lambda)b - 2c + 2(\zeta - 1)u) \mathbb{I}\left\{c + \frac{F(c)}{f(c)} \leq \frac{(1 + E\lambda)b}{2} + (\zeta - 1)u\right\} \right].$$

Interestingly, while the effect of an exogenous increase in u is ambiguous, job protection legislation can become more advantageous when there is a

²⁵For simplicity, it is assumed here that the principal cannot evade taxation.

²⁶Of course, if the government were only interested in maximizing the total surplus, it should set $u = 0$ whenever $\zeta > 1$, so that we would again be back in the basic model.

higher level of unemployment benefits, even though at first sight the two instruments might seem to be substitutes. As an illustration, consider again the example of the previous section, but now let $\zeta = 1.5$ and $u \geq 0$, as depicted in Figure 3.

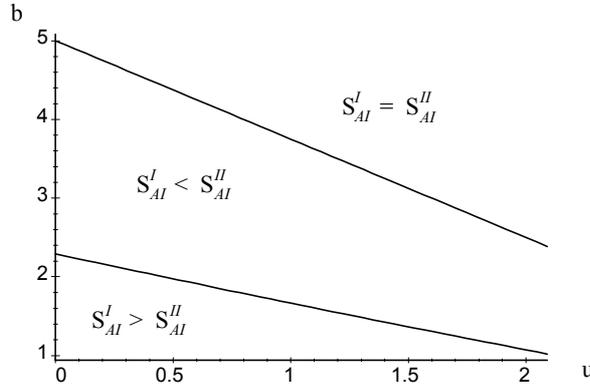


Figure 3. Unemployment benefits.

We already know that when $u = 0$, a job protection law decreases the expected total surplus ($S_{AI}^{II} < S_{AI}^I$) if b is sufficiently small, while it has no effect if b is sufficiently large. In the intermediate case ($2.29 < b < 5$), a job protection law raises the expected total surplus ($S_{AI}^{II} > S_{AI}^I$). As can be seen in Figure 3, when u is increased, so that avoiding the deadweight loss associated with unemployment becomes more important, the parameter range in which there is no difference between the two scenarios will be expanded. Now consider a fixed value of b such as 2. If $u = 0$, mandatory employment protection would decrease the expected total surplus. However, if u is increased to a sufficiently high value, then mandatory job protection will raise the total surplus. Hence, the stylized fact that many countries in continental Europe have decided to implement more generous unemployment benefit systems than the U.S. might even make employment protection legislation in the former countries relatively more advantageous.²⁷

²⁷According to Nickell and Layard (1999, p. 3045), in the U.S. the unemployment benefit replacement ratio is 50 % and the benefit duration is 0.5 years. The respective numbers for Spain, France, and Sweden are 70% (3.5 years), 57% (3 years), and 80% (1.2 years).

Moral hazard. In the basic model, in order to focus on the adverse selection effect, it has been assumed that the agent’s effort is verifiable, so that the agent always does his job when he is employed (because otherwise the principal would not have to pay the agreed-upon wage). Let us now briefly consider the case in which the agent chooses an effort level $e_i \in [0, 1]$ in period $i \in \{1, 2\}$, so that his payoff is $v_A(c) = x_1(w_1 - e_1c_1) + x_2(w_2 - e_2c_2)$ and the principal’s payoff is $v_P(\lambda) = x_1(e_1b - w_1) + x_2(e_2\lambda b - w_2)$. Suppose that while e_i is unobservable, the principal can condition the wage payment on a signal s_i . The signal is only obtained with probability $p \in (0, 1]$ and reveals whether the agent has shirked (i.e., $e_i < 1$) or not ($e_i = 1$).²⁸ It is straightforward to see that it is optimal for the principal to offer the same contract as in the basic model, except that now she pays $w_1(c)/p$ whenever s_1 indicates $e_1 = 1$ and $w_2(\lambda, c)/p$ whenever s_2 indicates $e_2 = 1$ (and no payments are made otherwise). In equilibrium the agent will not shirk, so that the analysis of the basic model remains valid.

Note that the principal might as well threaten to fire the agent if the signal reveals that he has shirked (although the threat to pay no wage is already sufficient). In this case, the principal would have a just cause to dismiss the agent. In this paper, no arguments are put forward against dismissing agents who do not do the job for which they have been hired.

As an illustration, if job security for professors means that they must not be punished for poor performance (measured e.g. by publications in renowned journals), then this clearly cannot be justified. As a counterexample, in Germany scientists below the rank of full professor usually only get fixed-term contracts,²⁹ i.e. they are automatically dismissed after a certain

²⁸One can show that the hidden action problem can also be solved with more general effort/signal structures, as long as the agent is risk-neutral and there are no binding liability constraints (see e.g. Kim, 1997). For more on the (im)possibility to separate hidden action and hidden information problems in different frameworks, see also Laffont and Tirole (1993) and Schmitz (2002a).

²⁹It takes a lawyer to understand how this sharp practice can be reconciled with the spirit of the EU Directive 1999/70/EC, which clearly says that “contracts of an indefinite duration are, and will continue to be, the general form of employment relationship”.

number of years – independent of their performance (see e.g. Schiermeier, 2002). Promotions at the same university are not possible and as temporary civil servants, the scientists are not even entitled to unemployment benefits. While this is an extreme example (the state does not allow private firms in Germany to treat their employees in the way in which the state-owned universities can treat their scientists), it is evident that here more job security (conditional on good performance) could be welfare improving.³⁰

The principal-agent paradigm. Throughout, it has been assumed that there is one principal and one agent. If there were $n > 1$ agents with private independent types, it would be optimal for the principal to use an auction-like mechanism in the spirit of Myerson (1981) to award the contract. Hence, if the agents were symmetric ($F_1 = F_2 = \dots = F_n$), the agent with the smallest costs would be chosen. Otherwise, the agent $i \in \{1, \dots, n\}$ with the smallest “virtual costs” $c_i + \frac{F_i(c_i)}{f_i(c_i)}$ would win the contract. In our complete contracting framework, there is nothing that could be gained by switching the agent after the first stage. Hence, the results obtained in the basic model qualitatively remain valid.³¹

However, if in addition there were multiple principals, the agency problem would be significantly more difficult. While recently some progress has been made in the literature on competing auctions, little is known so far about competing mechanisms in general.³² While a detailed treatment of this topic must hence await further research, it should be emphasized that a clear result can be stated with regard to the related issue concerning the principal’s bargaining power in the basic model. Following the principal-agent para-

³⁰The fact that the German science ministry regards scientists as production factors and not as human beings whose interests should enter the lawmaker’s welfare function is reflected by the wording of the ministry, according to which scientists have to be “scrapped” at the end of their temporary appointment (see Herbert, 2002).

³¹Of course, for a given value of b , the principal will now less often want to dismiss the agent, since the winner’s costs c are on average smaller the larger is n .

³²On competing auctions, see e.g. McAfee (1993), Peters and Severinov (1997), and Schmitz (2003). On competing mechanisms in general and the validity of the revelation principle in common agency games, see Martimort and Stole (2002).

digm, it was assumed that the principal offered the contract. As is usual in agency models, distortions occurred due to the principal's desire to reduce the agent's rent. If the principal's bargaining power were reduced to zero, the distortions would vanish and job security laws could no longer increase the parties' total welfare. Thus, if the stylized fact that in the U.S. culture geographical mobility is significantly higher than in southern Europe means that in the U.S. an employer is in a relatively weaker bargaining position (since the employee would be willing to move to another region in order to obtain a better offer), employment protection legislation could indeed be less advantageous in the U.S. than in the European countries.³³

7 Concluding remarks

The value of job security seems to be obvious to most non-economists. Someone who only has a fixed-term contract or who can easily be dismissed will suffer not only when he or she is particularly risk-averse. After all, an employee is not just a production factor such as a machine. An employee has a family and friends and might want to build a house and feel at home where he or she lives. It is important to be somewhat able to plan one's life, and many people (in particular in Europe) know what it means to be deeply rooted, they are not as mobile as capital and do not want to be forced to look for another job at another town when this means leaving one's family, friends, and home. Economists often disregard these obvious values which may be difficult to quantify. Yet, even a cold-hearted economist should acknowledge that a permanent employment relationship can have strong advantages. An employee who is happy in his or her private life may well be more productive. If I do not have to worry about where I might get a job in the future, I will be more concentrated on my work today. Employees who know that they are allowed to keep their jobs are more willing to identify with the employer's objectives and invest in specific skills.

³³Nickell and Layard (1999, p. 3047) report that in the U.S. regional mobility is about four times higher than in southern Europe.

In this paper it has been demonstrated that employment protection may well be desirable, even if all these obvious values of job security are disregarded.³⁴ In particular, it has been shown that in the presence of rents due to asymmetric information, state-mandated employment protection can increase the total surplus generated in the principal-agent relationship over and above the level that would be attained by private contracting. Of course, this does not necessarily imply that employment protection will actually be legislated whenever it would increase the expected total surplus, because in reality a government clearly is not benevolent. In practice, a decisive factor will be whether employers or employees have a stronger influence on the government.

In particular, a serious conflict of interests arises in a special case that has not received much attention in the literature. This is the important case in which the state is the employer. It is obvious that in this case the objective function of the legislator is biased towards the interests of the employer. As a result, employees of the state would not get enough job security if they were not protected by the constitution and courts that restrain the government. On the one hand, one could argue that this is a rationale for constitutional provisions that give civil servants a special status. On the other hand, this might in turn lead to overprotection. What is important is simply that the constitution assures that employees of the state do not get the kind of insecure jobs and fixed-term contracts that the government rightly prohibits in the private sector.³⁵ It is an interesting problem for future research to investigate how the constitution or other institutions should be designed in order to make sure that a reasonable degree of mandatory job protection is implemented when the government is not benevolent.

³⁴It should be noted that there are other policies that can also be welfare-enhancing in the simple model discussed here. Specifically, policies that can improve the bargaining strength of the agent can be beneficial, since distortions away from the first best only occurred due to the principal's aim to reduce the agent's rent.

³⁵For example, if a German university hires a secretary or a janitor, he or she will usually get a permanent job, while this is not the case for scientists. Obviously, non-scientific workers have a stronger lobby than scientists.

Appendix

Proof of Lemma 1.

“Only if”: Define $t(c) = E_\lambda [x_1(c)w_1(c) + x_2(\lambda, c)w_2(\lambda, c)]$, so that the incentive compatibility conditions can be written as

$$\begin{aligned} U(c) &= t(c) - E_\lambda [x_1(c) + x_2(\lambda, c)] c \geq t(\tilde{c}) - E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] c, \\ U(\tilde{c}) &= t(\tilde{c}) - E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] \tilde{c} \geq t(c) - E_\lambda [x_1(c) + x_2(\lambda, c)] \tilde{c}. \end{aligned}$$

These inequalities in turn imply

$$E_\lambda [x_1(c) + x_2(\lambda, c)] (\tilde{c} - c) \geq U(c) - U(\tilde{c}) \geq E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] (\tilde{c} - c).$$

In particular, $E_\lambda [x_1(c) + x_2(\lambda, c)] (\tilde{c} - c) \geq E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] (\tilde{c} - c)$, which means that $E_\lambda [x_1(c) + x_2(\lambda, c)]$ must be weakly decreasing in c . Moreover, assume w.l.o.g. that $\tilde{c} > c$, divide the chain of inequalities by $\tilde{c} - c$, and let \tilde{c} converge to c in order to see that $U'(c) = -E_\lambda [x_1(c) + x_2(\lambda, c)]$ almost everywhere. Thus, $U(c) = U(1) + \int_c^1 E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] d\tilde{c}$.

“If”: It has to be demonstrated that

$$\Delta(c) = U(c) - (t(\tilde{c}) - E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] c) \geq 0.$$

Using $U(c) = U(\tilde{c}) + \int_c^{\tilde{c}} E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] d\tilde{c}$ and $t(\tilde{c}) = E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] \tilde{c} + U(\tilde{c})$, one can easily check that

$$\begin{aligned} \Delta(c) &= E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] (c - \tilde{c}) + \int_c^{\tilde{c}} E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] d\tilde{c} \\ &= E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] (c - \tilde{c}) \\ &\quad + E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] \tilde{c} - E_\lambda [x_1(c) + x_2(\lambda, c)] c \\ &\quad - \int_c^{\tilde{c}} \tilde{c} \left(\frac{d}{d\tilde{c}} E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] \right) d\tilde{c} \\ &= (E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] - E_\lambda [x_1(c) + x_2(\lambda, c)]) c \\ &\quad - \int_c^{\tilde{c}} \tilde{c} \left(\frac{d}{d\tilde{c}} E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] \right) d\tilde{c} \\ &= \int_c^{\tilde{c}} (c - \tilde{c}) \left(\frac{d}{d\tilde{c}} E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})] \right) d\tilde{c} \geq 0. \end{aligned}$$

The second equality follows from partial integration and the inequality follows since $E_\lambda [x_1(\tilde{c}) + x_2(\lambda, \tilde{c})]$ is weakly decreasing in \tilde{c} . ■

References

- Addison, J.T. and Grosso, J.-L., 1996, Job Security Provisions and Employment: Revised Estimates, *Industrial Relations* 35, 585–603.
- Aghion, P. and Hermalin, B., 1990, Legal Restrictions on Private Contracts Can Enhance Efficiency, *Journal of Law, Economics, and Organization* 6, 381–409.
- Alvarez, F. and Veracierto, M., 2001, Severance Payments in an Economy with Frictions, *Journal of Monetary Economics* 47, 477–498.
- Bentolila, S. and Bertola, G., 1990, Firing Costs and Labour Demand: How Bad is Eurosclerosis?, *Review of Economic Studies* 57, 381–402.
- Bertola, G., 1990, Job Security, Employment and Wages, *European Economic Review* 34, 851–886.
- Bertola, G., 1999, Microeconomic Perspectives on Aggregate Labor Markets, in: Ashenfelter, O. and Card, D. (Ed.), *Handbook of Labor Economics*, Vol. 3, North-Holland, Amsterdam, pp. 2985–3028.
- Blanchard, O. and Landier, A., 2002, The Perverse Effects of Partial Labour Market Reform: Fixed-Term Contracts in France, *Economic Journal* 112, F214–F244.
- Blanchard, O. and Portugal, P., 2001, What Hides Behind an Unemployment Rate: Comparing Portuguese and U.S. Labor Markets, *American Economic Review* 91, 187–207.
- Buchanan, J.M. and Tullock, G., 1962, *The Calculus of Consent*, Ann Arbor: University of Michigan Press.
- Buechtemann, C.F., 1989, More Jobs Through Less Employment Protection? Evidence for West Germany, *Labour* 3, 23–56.
- Hart, O.D., 1995, *Firms, Contracts and Financial Structure*, Oxford: Clarendon Press.

- Herbert, U., 2002, Die Posse: An den Unis werden Massenentlassungen als Reform verkauft, *Süddeutsche Zeitung* 7 (January 9), 13.
- Hopenhayn, H. and Rogerson, R., 1993, Job Turnover and Policy Evaluation: A General Equilibrium Analysis, *Journal of Political Economy* 101, 915–938.
- Kim, S.K., 1997, Limited Liability and Bonus Contracts, *Journal of Economics and Management Strategy* 6, 899–913.
- Kuhn, P., 1993, Employment Protection Laws: Policy Issues and Recent Research, *Canadian Public Policy - Analyse de Politiques* XIX, 279–297.
- Laffont, J.-J. and Tirole, J., 1993, *A Theory of Incentives in Procurement and Regulation*. Cambridge: MIT Press.
- Lazear, E.P., 1990, Job Security Provisions and Employment, *Quarterly Journal of Economics* 105, 699–726.
- Leonard, J. and Schettkat, R., 1991, A Comparison of Job Stability in Germany and the US, *Labour* 5, 143–157.
- Levine, D.I., 1991, Just-Cause Employment Policies in the Presence of Worker Adverse Selection, *Journal of Labor Economics* 9, 294–305.
- Linowes, D.F. and Spencer, R.C., 1996, Privacy in the Workplace in Perspective, *Human Resource Management Review* 6, 165–181.
- Maskin, E. and Tirole, J., 1990, The Principal-Agent Relationship with an Informed Principal: The Case of Private Values, *Econometrica* 58, 379–409.
- Maskin, E. and Tirole, J., 1999, Unforeseen Contingencies and Incomplete Contracts, *Review of Economic Studies* 66, 83–114.
- Martimort, D. and Stole, L., 2002, The Revelation and Taxation Principles in Common Agency Games, *Econometrica* 70, 1659–1673.

- McAfee, R.P., 1993, Mechanism Design by Competing Sellers, *Econometrica* 61, 1281–1312.
- Myerson, R.B., 1981, Optimal Auction Design, *Mathematics of Operations Research* 6, 58–73.
- Myerson, R.B., 1982, Optimal Coordination Mechanisms in Generalized Principal-Agent Problems, *Journal of Mathematical Economics* 10, 67–81.
- Nickell, S., 1997, Unemployment and Labor Market Rigidities: Europe versus North America, *Journal of Economic Perspectives* 11, 55–74.
- Nickell, S. and Layard, R., 1999, Labor Market Institutions and Economic Performance, in: Ashenfelter, O. and Card, D. (Ed.), *Handbook of Labor Economics*, Vol. 3, North-Holland, Amsterdam, pp. 3029–3084.
- OECD, 1994, *The OECD Jobs Study*. OECD, Paris.
- OECD, 1999, Employment Protection and Labor Market Performance. *Employment Outlook*, OECD, Paris.
- Peters, M. and Severinov, S., 1997, Competition among Sellers Who Offer Auctions Instead of Prices, *Journal of Economic Theory* 75, 141–179.
- Pincus, L.B. and Johns, R., 1997, Private Parts: A Global Analysis of Privacy Protection Schemes and a Proposed Innovation for Their Comparative Evaluation, *Journal of Business Ethics* 16, 1237–1260.
- Pincus, L.B. and Trotter, C., 1995, The Disparity Between Public and Private Sector Employee Privacy Protections: A Call for Legitimate Privacy Rights for Private Sector Workers, *American Business Law Journal* 33, 51–89.
- Pissarides, C.A., 2001, Employment Protection, *Labour Economics* 8, 131–159.

- Plá Rodríguez, A., 1995, The Protection of Workers' Privacy: The Situation in the Americas, *International Labour Review* 134, 297–313.
- Saint-Paul, G., 2002, Employment Protection, International Specialization, and Innovation, *European Economic Review* 46, 375–395.
- Schiermeier, Q., 2002, Breaking the Habilitation Habit, *Nature* 415, 257–258.
- Schmitz, P.W., 2002a, On the Interplay of Hidden Action and Hidden Information in Simple Bilateral Trading Problems, *Journal of Economic Theory* 103, 444–460.
- Schmitz, P.W., 2002b, Simple Contracts, Renegotiation under Asymmetric Information, and the Hold-up Problem, *European Economic Review* 46, 169–188.
- Schmitz, P.W., 2003, On Second-Price Auctions and Imperfect Competition, *Journal of Mathematical Economics*, forthcoming.
- Schregle, J., 1993, Dismissal Protection in Japan, *International Labour Review* 132, 507–520.
- Schweizer, U., 1990, Calculus of Consent: A Game-Theoretic Perspective, *Journal of Institutional and Theoretical Economics* 146, 28–54.
- Tirole, 1999, Incomplete Contracts: Where Do We Stand?, *Econometrica* 67, 741–781.