Returns to Tenure and Employment Protection Policies in the US

Anne-Laure Mascle-Allemand*
*Université de Toulouse (GREMAQ)

Ahmed Tritah†
†Université de Toulouse (GREMAQ)

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Abstract
We study the impact of employment protection legislation on the returns to tenure in an environment with imperfect information on the job match quality. Workers can perform either a ‘skilled’ task whose productivity is very sensitive to match quality or an ‘unskilled’ task less risky, whose expected productivity is higher without information. The firm can invest in a costly signal which reveals match quality before hiring or reallocate the worker among tasks according to the information obtained while employed. We show that stricter employment protection increases the cost of forming low quality matches and leads the firm to invest more in the ex ante signal, which in turn lowers internal mobility and the returns to tenure. This result contrasts with the human capital argument which implies a positive relation between strictness of legislation and returns to tenure. The main prediction of the model is tested using US panel data drawn from the NLSY79 and information on the adoption across states from 1980 to 1996 of three common law exceptions to the employment at-will doctrine. We estimate a Mincerian wage equation and find that the "implied contract exception” significantly decreases the returns to tenure by 19.7 to 53.3 percent, which supports our information acquisition mechanism.

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*almascle@univ-tlse1.fr
†ahmed.tritah@univ-tlse1.fr

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1 Introduction

How does the introduction of dismissal restrictions modify wage profiles within the firm? Macroeconomists studying employment protection legislation (EPL) have mainly focused on the effects of dismissal restrictions on the employment level and on job flows\(^1\). This article addresses the new insight that wage profiles in firms are also modified by the employment protection legislative environment. The originality of this paper is that it focuses on the impact of legislative variables on the internal organization of the firm and thus on internal mobility and wage profiles offered by firms. To test our theoretical predictions, we use United States employment protection indicators.

While EPL strictness in the US is one of the lowest by international standards\(^2\), giving more importance to the role of courts and jurisprudence\(^3\), as suggested by Bertola, Boeri and Cazes (2000), provides a more accurate measure of the US employment protection strictness. Indeed, in the 1970s through the 1980s, numerous American state courts have recognized "exceptions" to "employment at-will" that limit the circumstances of worker dismissal. Under employment at-will, parties to an employment relationship can, in the absence of an explicit contract, unilaterally terminate the match at any time, for any reason, and without penalty. The exceptions introduced to that principle have given workers the opportunity to sue firms for wrongful discharge and have generated both litigation costs and uncertainty about the termination date of the employment relationship. They have been grouped into three broad categories: ‘implied contract’, ‘public policy’, and covenant of ‘good-faith and fair dealing’.

The US case constitutes a good ground for empirical analysis for two reasons. First, the content of these exceptions is relatively homogenous through time and through

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\(^1\)These effects have been investigated in particular by Lazear (1990), Bentolila and Bertola (1990), Boeri (1999), among others.

OECD (1999) proposes a good survey of empirical studies of the impact of employment protection legislations on the labor market performance.

\(^2\)Many studies establishing cross-country rankings (Lazear (1990), Bertola (1990), Grubb and Wells (1993), OECD (1994), OECD (1999)) agree on that point.

\(^3\)The previous studies focus mainly on three indicators: procedural requirements in case of dismissal; notice and severance pay provisions; and prevailing standards and penalties in case of unfair dismissal.
states which adopt them. Second, there is a lot of variation in the timing of adoption of these wrongful discharge doctrines across states. Indeed, while the number of states recognizing the "implied contract" and "public policy” doctrine has sharply increased from 1979 (respectively, from 6 states to 43, and from 8 states to 41), the "good faith and fair dealing” exception has been recognized only by a minority of states throughout the two decades (from 2 states in 1979 to 10 states nowadays).

However it appears quite difficult to directly evaluate the extent to which these exceptions impose costs on firms and restrict dismissals, due to a lack of systematic information on the number of wrongful discharge cases, courts decisions and required damages. Fortuitously, it is possible to have an indirect evaluation by looking at the impact of these adoptions on various labor market outcomes. Indeed, this issue has been addressed in recent articles. Autor, Donohue and Schwab (2004b) conclude to a negative and significant impact of the implied contract exception on the employment level. Autor (2004) confirms Miles (2000) previous findings on the impact of the implied contract exception on the demand for temporary help agency employment. As permanent workers become more expensive, firms have an incentive to substitute them with temporary ones. Finally, Kugler & Saint-Paul (2004) show that these exceptions, and specially the implied contract one, significantly decrease the re-employment probability of unemployed relative to employed workers. This article contributes to this literature by investigating the impact of these employment protection indicators on the returns to tenure.

To analyze the way wage profiles are modified by the introduction of EPL, it is useful to consider the nature of the match-specific learning process, as proposed by Nagypál (2000, 2002). Returns to tenure are either due to the accumulation of specific human capital or to the accumulation of information about the match specific quality. Nagypál tries to distinguish the two learning processes by analyzing their different impacts on the exit rate from jobs through different tenure levels. Then, she studies the impact of employment protection on productivity depending on the nature of the
According to the human capital accumulation approach, as tenure on the job increases, the worker accumulates more match-specific skills and hence her productivity rises. Examples of such learning by doing⁴ are a worker knowing how to repair her machine or a salesman learning the technical particularities of the different products sold by the firm. As dismissal legislations are adopted, the average tenure in firms is expected to increase. Then, the expected return of investing in match-specific human capital increases⁶. Given that the match-specific productivity raises through time at a higher rate, the associated wage profiles are steeper. Returns to tenure are increasing with the strictness of the EPL.

This article, on the contrary, argues that EPL strictness may rather decrease returns to tenure if information accumulation about the match specific quality is the main source of return to seniority. Following the job matching literature, originated by the work of Jovanovic (1979), match quality is assumed to be unknown at the beginning of the employment relationship. A worker-firm pair learns more precisely this quality over its employment relationship. Match quality may depend for instance on the compatibility of a worker with her co-workers or on the adequacy of the worker personality with the firm corporate culture. Low expected quality matches separate and the highest expected quality ones go on. Thus the average expected quality of an existing match rises through time. The wage profile increases according to the rate of accumulation of information about its quality.

Introducing EPL that restricts separations, increases the cost of being engaged in a bad quality match. The cost of experimentation of different matches thus increases. A way to avoid supporting this additional cost is rather to invest on costly information about the quality of the match before engaging in production and so to be more selec-

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⁴In her paper (2000), she criticizes the idea of using the effect of these two processes on wages to distinguish them, since the wages determination is difficult to tackle and suppose to add many other modeling assumptions. We avoid this problem by rather considering the impact of employment protection on the evolution of wages and not on the level of wages.

⁵The learning by doing concept was first developed by Arrow (1962).

⁶A recent paper of Belot, Boone and Van Ours (2002) analyzes this tradeoff between the cost of employment protection and this positive effect on productivity through higher incentives for job training.
tive *ex ante*. Better information about the match quality can be obtained either by a more selective recruitment procedure, or by a longer trial period, or by the use of fixed terms contracts. As the quality of the match is already more precisely evaluated, less remains to be learned, the accumulation rate of information through the employment relationship is then lower and returns to tenure tend to decrease.

In our model, returns to tenure are associated to a change of task within a firm. The more information the firm has about the match quality, the faster it allocates its worker between different tasks. High tenure workers are more efficiently allocated to tasks than recently hired workers. These hypotheses are motivated by a series of papers. Lazear (1993), using data from a particular American firm, found that within firm turnover rate from job to job is decreasing with tenure. The probability that a worker with one year of tenure will move to another job within the firm is above 20%, while it falls to 2% after 5 years of tenure. Baker, Gibbs and Holmstrom (1994) also found some evidence that the firm uses lower-level job performance to learn about the abilities of employees and uses this information in its subsequent promotion decisions7.

In the model, the firm faces the trade-off between the cost of investing in *ex ante* information on the match quality and the benefit of a faster allocation of the worker to a particular task. The introduction of EPL modifies the terms of the trade-off, by increasing the benefit of acquiring earlier information avoiding costly matching errors. As a corollary, firms have a better evaluation of the match quality and are then able to allocate their workers in a more efficient way. On average there are less occupational changes through the working life in the firm and returns to tenure are flatter.

To summarize, depending on the nature of the prevailing match specific learning process, returns to tenure can be rather increasing (in case of human capital accumulation) or decreasing (in case of information acquisition about the match quality). The issue of which learning process dominates on the US labor market and how wages do react to the adoption of wrongful-discharge doctrines are addressed in the empirical part of the paper.

7 New hires to a position have a greater variance of wages than workers promoted to the same position.
This issue was indeed already addressed by Schanzenbach (2003). His intuition is that these exceptions may provide an enforcement mechanism to implicit labor contracts. Implicit delayed-payment contracts are subject to employers opportunistic terminations, because performance comes before payment. Therefore, by protecting employees from employer opportunism, these exceptions are likely to facilitate the adoption of delayed-payment labor contracts. Therefore, returns to tenure are expected to increase following the adoptions of these exceptions. Schanzenbach tested the impact of these EPL indicators on the returns to tenure using two different data bases: the Current Population Survey (CPS) and the Panel Study of Income Dynamics (PSID). He concluded that returns to tenure did not increase after a state adopted one of the exceptions. On the contrary, his results rather show that adopting the implied contract exception decreases returns to tenure. Negative coefficients are found with the two data bases, although not always significant. Shanzenbach’s empirical results indeed strengthen our own findings.

Using the National Longitudinal Survey of Youth (NLSY) from 1980 to 1996, we perform a panel data estimation of a Mincerian wage equation and evaluate the impact of the adoption of the three exceptions of employment at will on the return to seniority. These data are suitable for this purpose as the detailed work history provides weekly data on individual work status, which allows the construction of precise measures of the actual on-the-job tenure and labor market experience.

We find that the implied contract exception significantly reduces returns to tenure. For the average worker, the return to tenure drops by 19.7 to 53.3 percent in states adopting this exception. This result is robust to the introduction of a number of controls such as time and state effects dummies as well as union membership or effective general experience.

Our main empirical finding suggests that information acquisition about the match-quality dominates the process of accumulation of human capital which is coherent with the Nagypál’s (2000) finding on a French matched employer-employee data set.

8On the contrary to the measures of tenure and experience we can obtain by using the PSID or the CPS.
Section 2 describes the partial equilibrium model of the labor market with imperfect information about the match-specific quality and shows that employment protection policies have a negative impact on returns to seniority. Section 3 presents the Wrongful-discharge doctrines in more detail. Section 4 describes the data base, the estimation method and presents the results. Section 5 concludes.

2 The Model

Both agents are risk neutral and live for two periods. At date 0, a firm meets a worker. If they decide to form a match, it lasts for a maximum of two periods.

Employment protection legislation is exogenously determined and imposed to the agents. Two different extreme cases are considered, either the firm is allowed to lay off workers or, on the contrary, it is strictly forbidden.

The match specific quality $\theta$ is unknown to both agents at date 0 and distributed over $[\theta_{\text{min}}, \theta_{\text{max}}]$ according to the density function $f(\theta)$ and the cumulative distribution function $F(\theta)$.

2.1 Production Structure

The worker can be allocated to two different tasks $T_i$ with $i = 1, 2$ in order to produce an unique output $Y$. Hence, two possible levels of production correspond to each quality level of the match $\theta$. Think of $\theta$ as the degree of adhesion of the worker to the corporate culture of the firm and of the two following tasks as a production engineer ($T_1$) and a commercial engineer ($T_2$). Productions in both tasks $Y_1(\theta)$ and $Y_2(\theta)$ are strictly increasing in $\theta$. $T_1$ is assumed to be on average more productive than $T_2$. If the firm has no ex ante information about the match quality $\theta$, it is optimal to affect the

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It would be equivalent in this article to consider the case of imperfect information about the worker productivity, as it is further assumed that, once the match is terminated the worker gets out of the labor market and receives an exogenous outside option (e.g. unemployment benefit, utility of leisure...). This outside option is independent of the information she has about her productivity. This assumption is necessary to get rid of asymmetric information issues in the relationship with following potential employers.
worker directly to the first task (see figure 1).

$$E(Y_1(\theta)) \geq E(Y_2(\theta))$$

However, production in $T_2$ is more sensitive to the quality level $\theta$. It means that high quality matches produce a higher output if workers are allocated to task 2. It is more important for the commercial engineer to conform to the firm’s rules and to share the firm’s corporate culture than it is for the production engineer since the commercial one is directly in touch with the firm’s customers. The high quality matches in which workers are allocated to task 2 are the ones with $\theta$ greater than a defined threshold $\theta^P$.

$$Y_2(\theta) > Y_1(\theta) \iff \theta > \theta^P$$

The match with quality $\theta^P$ is the one who produces the same level of output whatever the task:

$$\theta^P / Y_1(\theta^P) = Y_2(\theta^P).$$

### 2.2 Timing

The timing is represented in figure 2.
At date 0, both parties have no information \textit{ex ante} about the quality $\theta$. The firm may decide to acquire information. Whenever a firm meets a worker, it can choose to buy a signal at some price $P$. If it decides to buy the signal, both agents perfectly learn $\theta$. According to its information about the quality of the match, the firm decides to recruit the worker and to allocate her to one of the two tasks $T_1$ or $T_2$. Both parties agree on a wage contract contingent on the realization of the quality of the match $\theta^{11}$. At date 1, the match produces $Y_i$ (subscripts identify the task) and $\theta$ is realized and perfectly observed by both parties. The firm pays the worker the bargained wage for period 1, $w_i^1(\theta)$ (superscripts are used for the period). At the end of period 1, knowing $\theta$, the firm may choose to dismiss the worker or to reallocate her to an other task, where it would be more productive. Then, production takes place for period 2 and the firm pays the worker the wage, $w_i^2(\theta)$. At the end of period 2, the match ends as both agents live for two periods.

\footnote{To simplify the setting, we assume that the worker is credit constrained and not the firm so that the worker does not buy the signal.}
\footnote{We assume than once $\theta$ is learned by both agents at the end of period one, it is also observable by a third party that would enforce the signed contract.}

Figure 2: Timing of the Model
2.3 Information Acquisition & Returns to Tenure

For simplicity, it is always assumed that the worker has a sufficiently low outside option such that she would always prefer to participate in the match (except at a zero wage). Under this assumption, only the firm may choose to terminate the employment relationship by laying off its worker. The worker never chooses to quit. The following analysis focuses exclusively on the demand side of the labor market.

The firm has to decide whether it acquires information about the quality of the match before hiring the worker. The cost of having formed a low quality match depends on the employment protection legislation. Therefore, the signal acquisition decision has to be analyzed in the two possible legislative environments: either the firm is allowed to lay off its workers (L case) or it is strictly forbidden (\( \overline{L} \) case). First the benchmark case where there is no employment protection is considered.

2.3.1 No Employment Protection Case

The firm buys the signal at price P if its expected profit is greater when it acquires information. Both expected profits are then computed and compared to find the threshold value of the signal cost above which the firm gives up investing in the signal.

- Case \((L, \overline{S})\) : laying off is allowed (case \(L\)) and the firm does not buy the signal (case \(\overline{S}\))

At date 2, both parties perfectly know \(\theta\). The employee is allocated to the most productive task, either \(T_1\) or \(T_2\) depending on the realization of \(\theta\). We assume that the worker is paid by the firm proportionately to her production. Each party uses as a threat the possibility of destroying the ongoing production. The firm will pay the worker the following wage with \(\beta\) interpreted as the bargaining power of the worker:

\[
\begin{align*}
    w^1_2(\theta) &= \beta Y_1(\theta) \\
    w^2_2(\theta) &= \beta Y_2(\theta)
\end{align*}
\]

to simplify notations, \(w^2(\theta) = \beta \max(Y_1(\theta), Y_2(\theta))\)

\(^{12}\)Classical problems of ex post bargaining about the responsibility of the separation (layoff or quit?) are avoided under this assumption. Therefore, our model does not give any conclusion about the impact of employment protection on the level of wages.
Superscripts are used for the date $t$ while subscripts identify the task $T$.

The previous expressions are simple as it is further assumed that neither the firm nor the worker can decide to separate before the end of the period to save on the outside option. Once they have decided to start production, they have to wait until the end of the period to terminate the employment relationship\textsuperscript{13}.

At the end of period 1, the firm ends matches that are not productive enough i.e. that do not verify the firm participation constrain. The quality level $\overline{\theta}$ is defined as the threshold above which the firm decides to keep the worker.

$$\overline{\theta} / (1 - \beta) \max(Y_1(\overline{\theta}), Y_2(\overline{\theta})) = \pi$$
$$\forall \theta \geq \overline{\theta}, \Pi^2 = (1 - \beta) \max(Y_1(\theta), Y_2(\theta)) \geq \pi$$

$\pi$ identifies the outside option of the firm, above which the firm decides to form a match.

In a match with quality higher than $\overline{\theta}$, the worker is allocated to task 1 if this critical quality level $\overline{\theta}$ is lower than the technological threshold $\theta^P$, since she is more productive in task 1. Otherwise, if $\overline{\theta}$ is greater than $\theta^P$, she is allocated to task 2. To simplify notations, the two possibilities $\overline{\theta} \geq \theta^P$ are summarized by expressing the maximum of the production level in one of the two tasks.

At date 1, none agent has information about the match quality, in which case the worker is automatically allocated to the less risky task $T_1$. After $\theta$ is realized, the worker is paid proportionately to her contribution to the production.

$$\forall \theta, w^1_1(\theta) = \beta Y_1(\theta)$$

To summarize, at date 0, the firm proposes to the worker a wage contract contingent on the realization of $\theta$.

$$\begin{cases} w^1_1(\theta) = \beta Y_1(\theta) \\ w^2(\theta) = 0, i f \theta < \overline{\theta} \\ w^2(\theta) = \beta \max(Y_1(\theta), Y_2(\theta)), i f \theta \geq \overline{\theta} \end{cases}$$

\textsuperscript{13}The problem solved here is a particular and simplified version of a more general Nash bargaining problem.
Notice that the wage profile is increasing for the matches whose quality \( \theta \) is greater than the technological threshold \( \theta^P \) as the workers are reallocated from task one to task two.

The expected profit of the firm in the \((L, \overline{S})\) case is given by the following expression:

\[
\Pi^e_{L, \overline{S}} = (1 - \beta)E(Y_1(\theta)) + (1 - F(\overline{\theta}))(1 - \beta)E(\max(Y_1(\theta), Y_2(\theta)) = \overline{\theta}) + F(\overline{\theta})\pi
\]

The first term represents the firm share of the expected production level at date 1 when the worker is allocated to task 1. With probability \( p(\theta \geq \overline{\theta}) \), the firm has created a productive match and preserves it. Its expected profit is a fraction \((1 - \beta)\) of the expected maximum production level knowing that the match is highly productive. With probability \( p(\theta < \overline{\theta}) \), the firm prefers to separate and receives its outside option. The discount factor is omitted without loss of generality.

The \textit{ex ante} participation constrain of the firm in expected terms is assumed to be verified. Otherwise, no match would be formed in the no signal case.

\[
\Pi^e_{L, \overline{S}} \geq 2\pi
\]

The computed expected profit of the firm has to be compared to the one it gets if it acquires information about the match quality before hiring the worker.

- Case \((L, S)\) : laying off is allowed (case \(L\)) and the firm buys the signal (case \(S\))

As \( \theta \) is known at date 0, the worker is already optimally allocated at date 1 and is offered the wage contract shown below. Wages are still proportional to the worker’s production level. Notice that as the worker does not change her occupation, her proposed wage profile is then flat:

\[
\begin{align*}
w^1(\theta) &= 0, \text{ if } \theta < \overline{\theta} \\
w^1(\theta) &= \beta \max(Y_1(\theta), Y_2(\theta)), \text{ if } \theta \geq \overline{\theta} \\
w^2(\theta) &= w^1(\theta)
\end{align*}
\]

The firm only recruits a worker if \( \theta \) verifies his \textit{ex post} participation constrain. \( \pi \) is a sunk cost. Once the signal is bought, the firm still wants to hire the worker if its
profit is sufficiently high compared to its outside option. It is sufficient that $\theta$ verifies the first period participation constrain as it induces the second period one to be also verified.

$$\Pi^1(\theta) = (1 - \beta) \max(Y_1(\theta), Y_2(\theta)) \geq \pi$$

The same threshold $\overline{\theta}$ is found as in the previous case. The firm creates at date one matches of the same quality of those it keeps for period 2 in the $(L, S)$ case. Matches do verify the following participation constrain:

$$\frac{\overline{\theta}}{(1 - \beta) \max(Y_1(\theta), Y_2(\theta))} = \pi.$$  

Thus, the expected profit of the firm in the $(L, S)$ case is defined by:

$$\Pi^e_{L,S} = -P + 2(1 - F(\overline{\theta}))(1 - \beta)E(\max(Y_1(\theta), Y_2(\theta)) / \theta \geq \overline{\theta}) + 2F(\overline{\theta})\pi$$

First the signal is paid at price $P$. Either the match is of high quality with probability $p(\theta \geq \overline{\theta})$ and the firm hires the worker for two periods or the match is of low quality with probability $p(\theta < \overline{\theta})$ and the firm prefers its outside option for two periods. Acquiring information about the match quality \textit{ex ante} allows the firm to benefit from a better allocation of its worker from period one on. For the highest quality matches, workers are allocated from period one already to the task $T_2$.

The \textit{ex ante} participation constrain is still assumed to hold inducing the existence of any match.

$$\Pi^e_{L,S} \geq 2\pi$$

- Comparison of $\Pi^e_{L,S}$ and $\Pi^e_{L,\overline{\theta}}$ : For low values of the signal cost, the firm benefits from the further information it gets to better allocate workers between the two possible tasks from period one. The informational step consisting in allocating all workers to task one at period one to learn about the quality of the match is not necessary any more. The firm faces a trade-off between the cost of the signal and the benefit of a better allocation at date one.
This comparison allows us to define the critical cost of the signal above which the firm does not want to acquire information.

\[
\Pi^e_{L,S} \geq \Pi^e_{L,S}, \text{ i f f } P \geq (1 - F(\overline{\theta}))(1 - \beta)E(\max(Y_1(\theta), Y_2(\theta))/\theta \geq \overline{\theta}) + F(\overline{\theta})\pi - (1 - \beta)E(Y_1(\theta))
\]

If the cost of acquiring the signal exceeds the benefit of a better allocation of the worker at period one, the firm does not choose to buy information. The benefit of a better allocation called \( A \) is defined as the difference in the expected profits of the firm for period one in each case \( \overline{S} \) or \( S \).

For high values of the signal cost, the firm prefers to hire workers without information about the match quality. Nevertheless, this strategy could be very costly with restrictive dismissal legislations; the higher the cost of having formed a low quality match, the more difficult it is to dissolve it. In the following section we consider the extreme case, where the firm is forced to keep a bad match until the end of the contract, as the dismissal legislation prohibits laying off workers.

### 2.3.2 Restrictive Employment Protection Case

The two possible strategies, either buying the signal or not, are again compared in this new institutional environment. The benchmark case, in which the firm does not acquire information is first developed.

- **Case \((\overline{L}, \overline{S})\)**: laying off is forbidden (case \( \overline{L} \)) and the firm does not buy the signal (case \( \overline{S} \))

By assumption, the proposed wage is always sufficient to induce the worker to participate in the match and the firm is not allowed anymore to exit the employment relationship. Therefore every match goes on until the end of period 2 whatever the realization of \( \theta \). As the firm does not buy the signal in the \((\overline{L}, \overline{S})\) case, the worker is allocated to task 1 at period 1. Once \( \theta \) is known, she is either reallocated to task 2 at period 2 or maintained in task 1, depending on the true realization of \( \theta \) compared to
\( \theta^P \). Even matches of very low quality are maintained for period 2 and workers kept in task 1. Thus the average expected quality of an existing match at period 2 is lower.

Under the previous hypotheses we made (i.e. no quit and the impossibility to end a match before the end of production), the legal environment on dismissals has no impact on the way wages are determined. Wages are still proportional to the production level and similar to the previous \((L, S)\) case.

The proposed wage contract is the following:

\[
\begin{align*}
    w^1(\theta) &= \beta Y^1(\theta) \\
    w^2(\theta) &= \beta \max(Y^1(\theta), Y^2(\theta))
\end{align*}
\]

The expected profit of the firm in the \((\mathcal{L}, S)\) case is given by:

\[
\Pi^\mathcal{L,S} = (1 - \beta)E(Y^1(\theta)) + (1 - \beta)E(\max(Y^1(\theta), Y^2(\theta))
\]

In first period, the worker is allocated to task one and produces \(Y^1(\theta)\). In the second period the worker is optimally allocated and her production level depends on the realization of \(\theta\) compared to the technological threshold \(\theta^P\).

Again the \textit{ex ante} participation constrain should be verified for the existence of any match \(^{14}\). The average production in task one has to be greater than the outside option of the firm.

\[
E(Y^1(\theta)) \geq \pi
\]

As in the no employment protection case, not buying the signal reveals itself to be costly, since workers are not optimally allocated at period one. Moreover, the expected average quality of matches is lower. The benefit of acquiring the signal increases as it becomes more difficult to dismiss workers.

- Case \((\mathcal{L}, S)\) : laying off is forbidden (case \(\mathcal{L}\)) and the firm buys the signal (case \(S\))

\(^{14}\)This participation constraint imposes the most restrictive condition. If it is verified, the firm always wants \textit{ex ante} to form a match in all considered cases.
The benefits of acquiring the signal may overtake its cost and the firm may decide to buy it. As \( \theta \) is known, only the highest quality matches are then formed and workers are optimally allocated at period one. This case is completely equivalent to the \((L, S)\) case, where laying off a worker is allowed. The matches whose quality levels are higher than the same threshold \( \overline{\theta} \) are formed and last for two periods. Otherwise the firm prefers its outside option. In this way, the firm avoids the problem of being engaged in low quality matches at date 2.

The workers are proposed the same wage profile and the firms have the same expected profit as in the \((L, S)\) case:

\[
\left\{ \begin{array}{l}
w^1(\theta) = 0, if \theta < \overline{\theta} \\
w^1(\theta) = \beta \max(Y_1(\theta), Y_2(\theta)), if \theta \geq \overline{\theta} \\

w^2(\theta) = w^1(\theta)
\end{array} \right.
\]

\[
\Pi_{e,L,S} = \Pi_{e,L,S} = -P + 2(1 - F(\overline{\theta})) \left( (1 - \beta)E(\max(Y_1(\theta), Y_2(\theta)))/\theta \geq \overline{\theta}) + F(\overline{\theta}) \right)
\]

The firm decides to buy the signal comparing the two computed expected profits.

- Comparison of \( \Pi_{e,L,S} \) and \( \Pi_{e,L,S} \): Acquiring the signal is now more valuable. It avoids some matching errors inherent to the lack of information.

\[
\Pi_{e,L,S} \geq \Pi_{e,L,S} \ if \ f f \\
P \leq \left[ (1 - F(\overline{\theta}))(1 - \beta)E(\max(Y_1(\theta), Y_2(\theta)))/\theta \geq \overline{\theta}) + F(\overline{\theta}) \pi \right] - (1 - \beta)E(\max(Y_1(\theta), Y_2(\theta)))
\]

\( B \equiv \text{benefit of a better average quality} \)

\[
+ \left[ (1 - F(\overline{\theta}))(1 - \beta)E(\max(Y_1(\theta), Y_2(\theta)))/\theta \geq \overline{\theta}) + F(\overline{\theta}) \pi \right] - (1 - \beta)E(\max(Y_1(\theta)))
\]

\( A \equiv \text{benefit of a better allocation} \)

The firm decides to buy information at date 0, if the cost of acquiring the signal does not exceed the sum of two benefits: a better allocation at period one (A term) and a better expected average quality of existing matches at period two (B term). Only the most productive matches are kept at period two in the \((L, S)\)

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\(^{15}\) Again the assumptions insuring that the legislative environment on dismissals has no impact on the determination of wages are necessary for this result to hold.
case compared to the \((L, S)\) case where all matches are prolonged. Therefore, for intermediate values of the signal cost \(P\), acquiring the signal is valuable for the firm with stricter EPL and worthless without. The following proposition states this result:

**Proposition 1**

1. For any \(P\) verifying \(P < A\), the firm acquires the signal in both cases \(L\) and \(\overline{L}\), so workers are already placed in the optimal task from the first period and returns to tenure are flat.

2. For any \(P\) verifying \(A \leq P \leq A + B\), the firm does not acquire the signal when it is allowed to lay off, so for some workers engaged in matches verifying \(\theta > \theta^P\), returns to tenure are increasing. On the contrary, when laying off is forbidden, it decides to invest in the signal, and then returns to tenure are flat.

3. For any \(P\) verifying \(P > A + B\), the firm does not buy the signal in both cases \(L\) and \(\overline{L}\), and returns to tenure are increasing for the workers engaged in matches verifying \(\theta > \theta^P\).

**Proof.** It is sufficient to prove that \(A \geq 0\) and \(B \geq 0\) for the proposition to hold.

\[
A \equiv [(1 - F(\overline{\theta}))(1 - \beta)E(\max(Y_1(\theta), Y_2(\theta))/\theta \geq \overline{\theta}) + F(\overline{\theta})\pi] - (1 - \beta)E(Y_1(\theta))
\]

By definition, the conditional expectation is equivalent to:

\[
A \equiv [(1 - F(\overline{\theta}))(1 - \beta)E(\max(Y_1(\theta), Y_2(\theta))/\theta \geq \overline{\theta}) + F(\overline{\theta})\pi] - [(1 - F(\overline{\theta}))(1 - \beta)E(Y_1(\theta)/\theta \geq \overline{\theta}) + F(\overline{\theta})(1 - \beta)E(Y_1(\theta)/\theta < \overline{\theta})]
\]

According to the definition of the threshold \(\overline{\theta}\), given by \(\pi = (1 - \beta) \max(Y_1(\overline{\theta}), Y_2(\overline{\theta}))\), it gives:

\[
A \equiv (1 - F(\overline{\theta}))(1 - \beta) \left[ E(\max(Y_1(\theta), Y_2(\theta))/\theta \geq \overline{\theta}) - E(Y_1(\theta)/\theta \geq \overline{\theta}) \right] + F(\overline{\theta})(1 - \beta) \left[ \max(Y_1(\overline{\theta}), Y_2(\overline{\theta})) - E(Y_1(\theta)/\theta < \overline{\theta}) \right]
\]
Both terms in brackets are positive without assuming particular restrictions on the distribution function. The first term expresses the fact that workers in high quality matches can be better allocated in task 2 rather than in task 1 at period 1. The second term shows that it is more profitable for the firm to have its outside option rather than producing in task one when matches are of low quality.

\[
B \equiv \left[ (1 - F(\bar{\theta}))(1 - \beta)E(\max(Y_1(\theta), Y_2(\theta))/\theta \geq \bar{\theta}) + F(\bar{\theta})\pi \right] \\
- (1 - \beta)E(\max(Y_1(\theta), Y_2(\theta)))
\]

By definition of the conditional expectation, this is equivalent to:

\[
B \equiv \left[ (1 - F(\bar{\theta}))(1 - \beta)E(\max(Y_1(\theta), Y_2(\theta))/\theta \geq \bar{\theta}) + F(\bar{\theta})\pi \right] \\
- \left[ (1 - F(\bar{\theta}))(1 - \beta)E(\max(Y_1(\theta), Y_2(\theta))/\theta \geq \bar{\theta}) + F(\bar{\theta})(1 - \beta)E(\max(Y_1(\theta), Y_2(\theta))/\theta < \bar{\theta}) \right]
\]

According to the definition of the threshold \( \bar{\theta} \) such that \( \pi = (1 - \beta) \max(Y_1(\bar{\theta}), Y_2(\bar{\theta})) \), it gives:

\[
B \equiv F(\bar{\theta})(1 - \beta) \left[ \max(Y_1(\bar{\theta}), Y_2(\bar{\theta})) - E(\max(Y_1(\theta), Y_2(\theta))/\theta < \bar{\theta}) \right]
\]

Even when workers are better allocated, by definition of \( \bar{\theta} \), the firm prefers its outside option to low quality matches. The term in brackets is then positive. 

3 **Wrongful-Discharge Doctrines**

The common law restrictions to employment at will are divided into three main classes. Under the implied contract exception, courts infer the presence of a contract from the circumstances of an employment relationship. Such a contract can be created through either oral assurances (for instance, a promotion promise) or expectations created by employer’s handbooks, policies, or other written assurances. A landmark decision establishing the implied-contract exception was the 1980 case of **Toussaint v. Blue Cross & Blue Shild** (Autor, Donohue and Schwab, ADS 2004a), in which a dismissed worker successfully sued for breach of contract by citing an internal personnel policy
handbook stating that it was Blue Cross’s policy to terminate employees only for just cause. The court held that the handbook implied a binding contract, and the worker has to be remunerated for breach of contract. The expected employer costs of the implied-contract exception are difficult to assess. Two factors limit employer risk. First, implied-contract cases lead only to contractual damages (that is, economic rather than punitive or fully compensatory damages). Second, employers can potentially insulate themselves from implied-contract claims by rewriting employment contracts and handbooks to state clearly that all employment contracts are at will. On the other hand, the factors creating an implied-contract claim are vaguer than those for a public-policy claim, which likely contributes to employer uncertainty about the litigation risks entailed.

Second, the public policy exception prevents termination for reasons that violate a state’s public policy, for example, performing jury duty or reporting an employer’s wrongdoing. It also imposes limits on terminations by forbidding employers to lay-off workers for refusing to commit unlawful acts such as denying to commit perjury. The first case to recognize a public-policy exception occurred in California in 1959. In Petermann v. International Brotherhood of Teamsters (Muhl, 2001), Peter Petermann was fired because he refused to perjure himself for his employer’s benefit. The California appellate court recognized this layoff as illegal.

Finally, the covenant of good faith implies either that employer personnel decisions are subject to a “just cause” standard or that terminations made in bad faith or motivated by malice are prohibited. It prevents employers from firing workers to deprive them of earned benefits, such as sales commissions, pensions bonuses or Christmas bonuses. A leading example is the case Fortune v. National Cash Register Co. (ADS, 2004a), where the employer fired a salesperson just before a substantial commission was due.

The exception of good faith covenant represents the utmost departure from the traditional employment at will doctrine, as it imposes a covenant of good-faith into every employment relationship, but it is also the less widely adopted exception. In most
of cases, the public policy and the good-faith doctrines provide tort-based protection, meaning that plaintiffs can sue for punitive damages.

As shown on figure 3, states vary greatly in the timing and extent of their recognition of wrongful-discharge doctrines. According to Autor, Donohue and Schwarz (ADS, 2004b), while the number of states recognizing the “implied contract” and “public policy” doctrine has sharply increased from 1979 (respectively, from 6 states to 43, and from 8 states to 41), the “good faith and fair dealing” exception has been recognized only by a minority of states throughout the two decades (from 2 states in 1979 to 10 states nowadays). Most of the states adopting the good-faith covenant exception are western states. The largest number of states (40 states) recognize at least two doctrines. Seven states recognize all three doctrines16 (California, Arizona, Idaho, Utah, Wyoming, Alaska, Massachusetts), while three states still have recognized none of the doctrines (Florida, Georgia, Rhode Island).

The adoption of exceptions was widespread in the 1980s. In 1990, all states (i.e. 41 recognizing states) already recognized the implied contract exception, 42 out of 43 states already adopted the public policy and 8 out of 10 the good faith covenant exception.

It seems difficult to select a single case as the precedent for a state’s recognition of a particular wrongful discharge. Therefore, authors working on that topic not necessarily agree on the dates of adoption. There are currently two main classifications available provided by Walsh and Schwarz (WS, 1996)17 and Autor, Donohue and Schwab (ADS, 2004a). They use different criteria to select the relevant cases. Autor, Donohue and Schwab (2004) “looked for the first major appellate-court decision that signaled the sustained adoption of the particular at-will exception. By contrast, Walsh & Schwarz select cases that best articulate court’s rationales for promulgating a new doctrine, cases that provide the clearest articulation of the newly adopted doctrines”. Therefore,

---

16Montana also recognized the three doctrines as from now, it is the only state to have passed a statute (since 1987) establishing a good-cause standard for employment terminations. All other recognitions are common law doctrines.

Walsh & Schwarz, most of the time, have selected posterior adoption dates than Autor, Donohue and Schwab. In the following sections, only the results using the ADS classification are presented, as it is the widely used in recent articles (Schanzenbach (2003), Kugler and Saint-Paul (2004), Autor (2004), and ADS(2004b)). We also checked the robustness of our results using the WS classification.\footnote{The results using the WS classification would be provided on request. Using “post-adoption” time dummies, we found that the impact of adopting an exception at the date chosen by ADS is stronger two years after the change. This may explain why the estimates using WS classification are even more significant than the one presented below.}

4 Empirical Evidence from the US

4.1 Presentation of the Data Base

For the purpose of testing our theoretical predictions we match information from three sources. Annual data from 1980 through 1996 for young workers drawn from the NLSY79 are matched with information on their state of residence from the NLSY’s...
Geocode file. Lastly, we use the date of adoption of common law exceptions from ADS (2004a).

The NLSY 1979 young adult cohort is a panel of 12686 male and female youths, aged 14 to 21 in 1979. This data set has substantial advantages for our study as it allows to draw a weekly work history of subjects and to construct precise measures of the actual on-the-job tenure and labor market experience\textsuperscript{19}. This contrasts with other candidate data sets that have been used to investigate returns to tenure and that do measure tenure and wages only at annual frequency. In particular, the drawback with the PSID data set (the primary data source used to study returns to tenure) is that it only offers limited information on job changes, so that the econometricians, as Altonji and Shakotko (AS, 1987) or Topel (1991) were constrained to work with annual data. When the worker changes job during the year (see Connoly and Gottschalk, 2001), it is impossible in the PSID to distinguish clearly between the old job tenure and earning and the new job tenure and earning. The NLSY overcomes these problems by including every year the key variables enabling to track the work history of an individual both while working for the same employer and when moving to a new employer\textsuperscript{20}. Another advantage of using the NLSY79 is that the survey covers the period during which most of states adopted the common law exceptions. Indeed prior to the 1980s, only a handful of states recognized exceptions, but by the end of the decade an overwhelming majority did.

Although the NLSY79 records information about multiple jobs, we only consider the Current Population Survey (CPS) job which is first, the main or more recent job held at the time of interview and second, the job for which more detailed information is available. We restrict our sample to those working for a private profit organization and working for a wage of at least one dollar in 1987 constant value, and on full time basis, which we take to be equivalent of at least 20 hours worked in a week. Wages

\textsuperscript{19}Most of papers on returns to tenure have to rely on potential experience (age minus education minus six). Here we can construct a precise history of experience taking into account unemployment and out of labor force spells.

\textsuperscript{20}We should note that NSLY data are employer-based and not job-based, hence we can not keep track of job changes that occurs with the same employer.
Table 1: Mean Sample Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean/Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Hourly Wage ($1979)</td>
<td>6.24</td>
</tr>
<tr>
<td>Hours worked</td>
<td>43.8</td>
</tr>
<tr>
<td>Potential experience</td>
<td>7.2</td>
</tr>
<tr>
<td>Tenure</td>
<td>2.9</td>
</tr>
<tr>
<td>Years in school</td>
<td>12.4</td>
</tr>
<tr>
<td>Percentage married</td>
<td>52.1</td>
</tr>
<tr>
<td>Age</td>
<td>29</td>
</tr>
<tr>
<td>Number of individuals</td>
<td>3469</td>
</tr>
<tr>
<td>Number of observations</td>
<td>26349</td>
</tr>
</tbody>
</table>

are deflated using a consumer price index provided by the Bureau of Labor Statistics. Working students are dropped not to confound their low wages with those of other low-wage respondents.

To avoid dealing with issues involving the White/Black and Male/Female wage gap which may spur the effect we are looking for, we restrict our sample to white male\textsuperscript{21}. Lastly, since the work history can not be tracked before 1979, our sample begins in 1980, ending up with 26349 observations over the period 1980-1996. Individuals enter the sample as they enter in the labor market.

Table 1 shows the means for a key set of variables included in our regressions:

4.2 Specification and Methodological Background

Returns to tenure have fueled a lot of debate among economists and depending on the estimation procedure results range from negligible impact (AS, 1987), to as much as 25% of wage gain for 10 years of tenure for Topel (1991). Much of the debate on this issue focused on the appropriate econometric methods to be used to handle the issue of endogeneity of the tenure variable. For the purpose of testing our theoretical prediction regarding the impact of firing legislations on the returns to tenure we will estimate the following standard model of wage determination where we add the three state’s

\textsuperscript{21}Some authors argue that our EPL indicators may be less effective as a firing restriction for minorities and female since those groups are already covered by equal opportunity laws that may be more protective (see Schanzenbach, 2003 for a discussion on this point).
legislations dummies and their cross products with respect to tenure and experience:

\[ W_{ijt} = \beta_0 t + \beta_1 Exp_{ijt} + \beta_2 Ten_{ijt} + \beta_3 Ten^2_{ijt} + \beta_4 LEG_{ilt} + \beta_5 LEG_{ilt} \times Ten_{ijt} + \beta_6 LEG_{ilt} \times Exp_{it} + \beta_7 LEG_{ilt} \times Ten^2_{ijt} + \epsilon_{ijt}. \]

Where \( W_{ijt} \) denotes the log of real hourly wage rate of person \( i \) in job \( j \) at time \( t \), \( Exp \) is the total labor market experience, \( Ten \) is the tenure with the current employer (current job seniority), and \( LEG_{ilt} \) is a dummy variable taking the value one if the individual is working in a state that adopted the legislation \( l \) at time \( t \). Parameters \( \beta_1, \beta_2 \) represent average returns to an additional year of experience and tenure, respectively. The coefficients \( \beta_4, \beta_5 \) are the additional returns to one year tenure and experience in states having adopted legislation \( l \), compared to states that do not. \( \beta_3 \) measures the growth rate of the returns to tenure, and \( \beta_7 \), the way it is modified by the adoption of a given legislation \( l \). For references with research on the effects of firing legislation on the labor market we will also comment on the coefficient \( \beta_4 \), measuring the impact of legislations on wage levels in adopting states. The parameter \( \beta_0 \) controls for the economy wide trend. Altonji and Williams (1997) use different treatments of time trend and found minor effect in their OLS estimates. We rely on their results here and include in the estimation year specific dummies, noted \( t \).

Several issues due to unobserved heterogeneity \( (\epsilon_{ijt}) \) need to be carefully handled when one deals with the previous equation. This unobserved heterogeneity can be decomposed as follows:

\[ \epsilon_{ijt} = \mu_i + \theta_{ij} + \eta_{ijt} + u_{it}. \]

where \( \mu_i \) is a fixed individual specific error component, \( \theta_{ij} \) is a fixed job match specific error component, \( \eta_{ijt} \) is a time varying job match specific component, and \( u_{it} \) is

\(^{22}\)For the ease of presentation the equation abstracts from a set of control variables and non linear terms in experience.

\(^{23}0.22\) for 10 years of tenure using year dummies and 0.25 using deflated wages.

\(^{24}\)Results on tenure coefficient have shown to be sensitive to the method used for dealing with the time trend (see Altonji and Williams, 1992). Hence, in a more systematic approach, we will test the robustness of our results to different detrending methods.
the remaining error term. Usually \( u_{it} \) is ignored as it is unlikely to be related to turnover behavior. Topel (1991) argued that \( \eta_{ijt} \) is unlikely to influence returns to tenure if it follows a random walk and shows that the data are consistent with that. We will thus rely on his result. More problematic are the possible correlations of the individual and job fixed effects with unobserved individual, \( \mu_i \), and match specific heterogeneity, \( \theta_{ij} \), which lead to potential biases in the estimation of returns to tenure and experience. These correlations are specific in the sense that they are the outcome of optimizing search behavior. In particular those individuals with high \( \mu_i \) (high productivity) may have experienced less unemployment. Individual heterogeneity associated with \( \mu_i \) will bias OLS estimate of the wage-tenure profile upward. Also, matching and search models imply that job shopping over a career will induce a positive correlation between experience and the job match specific component, this will bias upward the coefficient on experience. To provide some correction for these problems, we adopt the instrumental variable methodology proposed by AS (1987). Tenure and its square are instrumented with their deviation from job-match means, \( \tilde{T}_{ijt} = T_{ijt} - \bar{T}_{ij} \) and \( (\tilde{T}_{ijt})^2 = T_{ijt}^2 - (\bar{T}_{ij})^2 \) whereas experience and its square are instrumented with their deviations from individual means, \( \tilde{Exp}_{it} = Exp_{it} - \bar{Exp}_i \) and \( (\tilde{Exp}_{it})^2 = Exp_{it}^2 - (\bar{Exp}_i)^2 \). The instruments for tenure and experience are, by construction, uncorrelated with match quality and individual components\(^{25}\).

Finally, since the same individuals are followed over time, residuals are serially correlated due to the presence of a fixed individual effect. Henceforth, all regressions will be done using Generalized Least Square under the assumption that the error term contains an individual-specific component.

\(^{25}\)Topel (1991) proposed a two step method to deal with the endogeneity issue. The Topel’s method is worth to apply here since the first step involve computing the within job growth rate, which is by itself an interesting component given our focus. We look forward to apply the Topel’s estimation and compare it to our results. (see also Farber for an other method)
4.3 Estimation Results

As a benchmark with others studies we note that our basic regression display coefficient estimates that are in accordance with other mincerian wage estimations on US labor market. Notably we find that a worker with 10 years of tenure on the job is paid around 20% more than the same worker entering the job, which is in the range of Topel’s result’s from the PSID, and Bratsberg and Terell (1997) results from NSLY. Return to general human capital as measured by labor market experience is higher than the returns to specific human capital and is also in the range of findings in the literature. As expected, local unemployment rate has a negative impact on wages. We also find a significant wage premium for unionized workers.

According to the literature on returns to tenure estimation, returns to tenure are reduced by half using instrumental variables estimators, whereas returns to experience are rather increased (see table 2 and table 3).

From this base wage equation we investigate the impact of firing legislations on returns to tenure. Firing legislations dummies are first introduced one by one and then together\(^\text{26}\). We focus on their impact on return to tenure, which is the main effect we are interested in, and marginally on their impact on wages. In both specifications, GLS (random effect) and IV-GLS (random effect), we found that in states that have adopted the implied contract policy (\textit{dic}) wage profiles are much flatter since returns to tenure are reduced by more than 30% in the GLS specification (table 2) and by almost 54% in the IV-GLS (table 3). The public policy exception, has also a negative but not significant impact on returns to tenure without using instrumental variables. However, it has a positive and significant, but smaller impact once instrumented. Given that most of the states have adopted these two exceptions together, the total impact of having adopted these exceptions is significantly negative and close to 20 to 30 percent.

The good faith exception does not seem to have any significant impact on returns to tenure. The previous results seem to confirm our theoretical prediction and suggest

\(^{26}\)Only the results, where they are all included together, are presented here, the other results may be obtained on request.
that wage growth within the firm is mainly due to an acquisition of information process about the match quality and that firing legislations change the terms of trade-off in favor of early gathering of information (at the hiring stage).

The robustness of our results is also checked using fixed-effect estimators, which do not change substantially our findings. It is worthy to note that returns to experience increase sharply in the absence of instrumental variables.

Another interesting result concerns the second-order effect of the legislation on wages. We find, whatever the estimation method, a positive coefficient on $dic \times Ten^2$. The concavity of the wage function relative to tenure, which means that the rate of learning on the match quality is higher at the beginning of the job, is thus reduced. This result is coherent with our theoretical prediction that less gains from information acquisition remain to be done in states with tougher EPL. The wage evolution divergss more at the beginning of the job match than later on, as it appears clearly on figure 4, which depicts the wage evolution depending on the adoption of the implied contract exception.

Figure 4: Returns to Tenure
### Table 2: Earnings functions estimates

**Dependent Variable: Log of Real Hourly Labor Income ($1987)**

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>OLS</th>
<th>random effect</th>
<th>fixed effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenure</td>
<td>.0773***</td>
<td>.0640***</td>
<td>.0683***</td>
</tr>
<tr>
<td></td>
<td>(.0072)</td>
<td>(.0046)</td>
<td>(.0049)</td>
</tr>
<tr>
<td>Tenure^2</td>
<td>-.0046***</td>
<td>-.0046***</td>
<td>-.0056***</td>
</tr>
<tr>
<td></td>
<td>(.0007)</td>
<td>(.0004)</td>
<td>(.0004)</td>
</tr>
<tr>
<td>Experience</td>
<td>.0349***</td>
<td>.0465***</td>
<td>.1247***</td>
</tr>
<tr>
<td></td>
<td>(.0041)</td>
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<td>Experience^2</td>
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<td>-.0028**</td>
</tr>
<tr>
<td></td>
<td>(.0010)</td>
<td>(.0008)</td>
<td>(.0013)</td>
</tr>
<tr>
<td>dic (implied contract)</td>
<td>.0243</td>
<td>.0508***</td>
<td>.1282***</td>
</tr>
<tr>
<td></td>
<td>(.0144)</td>
<td>(.0122)</td>
<td>(.0118)</td>
</tr>
<tr>
<td>dpp (public policy)</td>
<td>-.0274</td>
<td>-.0247*</td>
<td>.0334***</td>
</tr>
<tr>
<td></td>
<td>(.0199)</td>
<td>(.0131)</td>
<td>(.0127)</td>
</tr>
<tr>
<td>dgf (good faith)</td>
<td>-.0455</td>
<td>-.0498**</td>
<td>-.0331*</td>
</tr>
<tr>
<td></td>
<td>(.036)</td>
<td>(.025)</td>
<td>(.0176)</td>
</tr>
<tr>
<td>Tenure*dic</td>
<td>-.0152**</td>
<td>-.0206***</td>
<td>-.0286***</td>
</tr>
<tr>
<td></td>
<td>(.0072)</td>
<td>(.0046)</td>
<td>(.0048)</td>
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<tr>
<td>Tenure*dpp</td>
<td>-.0109</td>
<td>-.0008</td>
<td>-.0015</td>
</tr>
<tr>
<td></td>
<td>(.0075)</td>
<td>(.0045)</td>
<td>(.0048)</td>
</tr>
<tr>
<td>Tenure*dgf</td>
<td>-.0054</td>
<td>.0011</td>
<td>.0055</td>
</tr>
<tr>
<td></td>
<td>(.0071)</td>
<td>(.0044)</td>
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<td>Tenure^2*dic</td>
<td>.0013**</td>
<td>.0020***</td>
<td>.0026***</td>
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<tr>
<td></td>
<td>(.0007)</td>
<td>(.0004)</td>
<td>(.0004)</td>
</tr>
<tr>
<td>Tenure^2*dpp</td>
<td>.0009</td>
<td>.0004</td>
<td>.0006</td>
</tr>
<tr>
<td></td>
<td>(.0007)</td>
<td>(.0004)</td>
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<tr>
<td>Tenure^2*dgf</td>
<td>-.0004</td>
<td>-.0005</td>
<td>-.0008**</td>
</tr>
<tr>
<td></td>
<td>(.0005)</td>
<td>(.0004)</td>
<td>(.0004)</td>
</tr>
<tr>
<td>Experience*dic</td>
<td>-.0019</td>
<td>-.0074***</td>
<td>-.0105***</td>
</tr>
<tr>
<td></td>
<td>(.0036)</td>
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<td>(.0024)</td>
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<tr>
<td>Experience*dpp</td>
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<td>-.0046**</td>
<td>-.0079***</td>
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<td></td>
<td>(.0038)</td>
<td>(.0023)</td>
<td>(.0024)</td>
</tr>
<tr>
<td>Experience*dgf</td>
<td>.0123***</td>
<td>.0100***</td>
<td>.0137***</td>
</tr>
<tr>
<td></td>
<td>(.0034)</td>
<td>(.0021)</td>
<td>(.0027)</td>
</tr>
</tbody>
</table>

Note: all regressions include controls for time trend, state of residence, union membership, local unemployment rate, marital status, education, and AFQT (Armed Forced Qualification Test) score.

*** significant at 1% ** significant at 5%, * significant at 10%. Standard deviations are given into parentheses.
Regarding the effect on the wage levels, the three exceptions have heterogeneous impacts, that are not always robust to the estimation method. Whereas the implied contract exception has always a positive impact on wages, the good-faith exception has always a negative one. The public policy exception’s impact is not stable. According to the literature, the impact of EPL on wages is not clear and is a sum of many contradictory effects.

Finally, the implied contract and the public policy exceptions have clear negative impacts on the returns to experience, whereas the good faith covenant has a strong and positive impact on the returns to experience. As the good faith exception was only adopted by a minority of states, mainly western states, the total impact of our EPL indicators on the returns to experience is mostly negative. This result could be understood in terms of job shopping. More efforts are provided early in the career to find a good job, as it becomes more difficult to change jobs with stricter EPL. It could also be that general human capital is less valued with tougher EPL as it is less easy to change jobs.

5 Conclusion

The internal organization of the firm is no longer the ”black box” of neoclassical models. A huge strand of the literature is now devoted to understand the wage formation, the organization of the promotion system, internal mobility. However, only a few number of articles are interested in the impact of the firm’s environment on its internal organization. The originality of our model is that it addresses the impact of employment protection on internal mobility, hence on the wages growth rate within the firm. EPL is not neutral for the employer’s human resources policies. Our model predicts that higher separation costs increase the firm’s incentives to adopt more selective and expensive recruitment procedures, to opt for flexible and fixed-term employment contracts and to impose longer trial periods. Then, depending on the legislative environment, the firm does not offer the same career perspectives and internal mobility paths. We expect internal mobility to decrease faster with tenure in tougher employment pro-
Table 3: Earnings functions estimates

<table>
<thead>
<tr>
<th>Dependent Variable: Log of Real Hourly Labor Income ($1987)</th>
<th>Instrumental Variables Estimators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent variables</td>
<td>IV random effect fixed effect</td>
</tr>
<tr>
<td>Tenure</td>
<td>.0291*** (.0087) .0313*** (.0067) .0317*** (.0067)</td>
</tr>
<tr>
<td>$^2$ Tenure</td>
<td>-.0028*** (.0088) -.0031*** (.0055) -.0032*** (.0067)</td>
</tr>
<tr>
<td>Experience</td>
<td>.0502*** (.0050) .0558*** (.0032) .0536*** (.0040)</td>
</tr>
<tr>
<td>$^2$ Experience</td>
<td>-.0027** (.0111) -.0007 (.0099) .0026** (.0013)</td>
</tr>
<tr>
<td>$^*$ dic (implied contract)</td>
<td>.0184 (.0208) .0482*** (.0127) .0512*** (.0133)</td>
</tr>
<tr>
<td>$^*$ dpp (public policy)</td>
<td>-.0619*** (.0221) -.0329** (.0135) -.0303** (.0141)</td>
</tr>
<tr>
<td>$^*$ dgf (good faith)</td>
<td>-.0275 (.0361) -.0442* (.0226) -.0420* (.0237)</td>
</tr>
<tr>
<td>Tenure $^*$ dic</td>
<td>-.0121 (.0087) -.0167*** (.0063) -.0167*** (.0064)</td>
</tr>
<tr>
<td>Tenure $^*$ dpp</td>
<td>.0206** (.0088) .0109* (.0062) .0093 (.0062)</td>
</tr>
<tr>
<td>Tenure $^*$ dgf</td>
<td>-.0100 (.0080) -.0054 (.0061) -.0044 (.0061)</td>
</tr>
<tr>
<td>$^2$ Tenure $^*$ dic</td>
<td>.0011 (.0088) .0016*** (.0055) .0017*** (.0055)</td>
</tr>
<tr>
<td>$^2$ Tenure $^*$ dpp</td>
<td>-.0012 (.0088) -.0003 (.0044) -.0002 (.0055)</td>
</tr>
<tr>
<td>$^2$ Tenure $^*$ dgf</td>
<td>.0001 (.0077) -.0003 (.0044) -.0003 (.0044)</td>
</tr>
<tr>
<td>Experience $^*$ dic</td>
<td>-.0016 (.0046) -.0079*** (.0026) -.0081*** (.0027)</td>
</tr>
<tr>
<td>Experience $^*$ dpp</td>
<td>-.0086* (.0048) -.0065** (.0025) -.0053** (.0026)</td>
</tr>
<tr>
<td>Experience $^*$ dgf</td>
<td>.0097** (.0042) .0189*** (.0024) .0113*** (.0028)</td>
</tr>
</tbody>
</table>

Note: all regressions include controls for time trend, state of residence, union membership, local unemployment rate, marital status, education, and AFQT (Armed Forces Qualification Test) score.

*** significant at 1% ** significant at 5%, * significant at 10%. Standard deviations are given into parentheses.
tection environments than in softer environments. It would be really interesting to test this prediction by comparing US and European countries and this would certainly help us to better understand the contrasted evolution of wages inequalities within the firm.

Due to a lack of data on the internal organization of the firm, we only successfully tested the main conclusion of our model, i.e. that tougher EPL decreases returns to tenure, without testing our main assumption, that it is due to lower internal mobility.

Nevertheless, our empirical study on the US case seems to confirm that information acquisition is the prevailing learning process within the firm, as found by Nagypál (2000). Being able to assess the relative importance of the learning by doing versus the learning about the match quality processes may have strong practical implications for the firm’s dismissal, promotion, and training policies.

This article can be extended by looking at the impact of EPL on different categories of workers, for instance, by educational attainment levels or by sectorial activities. According to our theoretical argument, we expect that the impact of our EPL indicators on the returns to tenure would be stronger for those categories of workers, where information acquisition is relatively more important: that is for low tenure, high education and skilled occupation workers.
References


