Do Labor Market Conditions Affect the Strictness of Employment Protection Legislation?

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Abstract

We provide a theoretical microfoundation for the inverse relationship between firing costs and labor market tightness and evaluate the effects of this relationship on labor market performance in a matching model *à la* Mortensen and Pissarides (1994). Results are clear cut and generalize our previous work. First, a sufficient condition to have a firing cost function with a negative slope is when the elasticity of the separation rate with respect to firing costs is equal to one, i.e. when the median voter (which is the employed worker) takes into account in her choice of optimal level of firing costs only the unemployment duration during her lifetime but not the potential gains or losses in terms of wage. Second, the optimal behavior of the economic agents can give rise to a labor market configuration characterized by multiple equilibria: high average duration of unemployment will produce a labor market with low flows and wage and high strictness of employment protection, and vice versa.

JEL classifications: J64, J65
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The "state of the art" of economic theory about the effects of employment protection legislation (EPL) on labor market performance does not seem to be very useful for policy makers. A wide economic literature has produced a variety of results and conclusions.

Some economists argue that the strictness of EPL is the main responsible for the disappointing labor market performance in Europe. Strict EPL makes the labor market "sclerotic", reducing job turnover and increasing unemployment spell. According to Nickell (1997), this is the received wisdom.

As is well known EPL has two components: severance payments, a transfer to the worker at the end of the job relationship, and firing costs, a deadweight loss associated with job destruction. As for the former, Lazear (1990) has shown that, if market are complete and competitive, the effects on overall unemployment are neutral, since the effect of the severance payment is neutralized by the bargaining between workers and firms. As a consequence of this neutrality result, most of the literature has focused on the analysis of the effects of firing costs.

The interaction between shocks and labor market institutions, with particular focus firing costs, in the debate on the so-called Eurosclerosis has been investigated, among others, by Bentolila and Bertola (1990), Blanchard (2000), Blanchard and Portugal (2001) and Ljungqvist (2002). In a matching framework, Mortensen and Pissarides (1999) point out the ambiguous effects of layoff costs on equilibrium unemployment by the reduction of the inflows into unemployment (caused by the longer duration of a filled job) and the increase of the average duration of unemployment (because of the negative effects on the propensity to hire).

Other economists highlight the usefulness of EPL as a remedy against market failures. If unemployed workers are risk-adverse, EPL can be a form of insurance against the reduction of income associated with job loss (Pissarides (2001), Bertola (2004)). In such a situation, this is because, firms provide a form of insurance exchanging a premium in term of lower wage with a longer employment relationship. Moreover, a stable employment relationship is also able to favour long term investment in firm specific human capital, and to promote cooperation with workers, thus improving productivity (Nickell and Layard (1999)).

More recently, economic literature has begun to investigate the evolution of labor market institutions and the complexity of the employment protection systems.

Blanchard and Tirole (2004) show that firing costs are the natural counterpart to the state provision of unemployment benefits. The second requires the first, so that they are the basic components of the optimal set of labor market institutions. They assess this principle in a basic framework where workers are risk adverse and adjust it to take into account there labor market "imperfections", such as limits on insurance, difficulties for firms to pay layoff taxes, ex-post wage bargaining and heterogeneity of workers and/or firms. Furthermore, they argue that an issue still to be explored is the role of judges who, in many European countries, often have to play the role to decide whether layoffs are justified or not. Since the implications of imperfections require to adapt the layoff taxes to particular situations, they state that this could be done by leaving some discretion to judges.[1]

[1]See also Blanchard and Tirole (2003) which focus the considerations in the main text

Donohue and Siegelman (1995), Berger (1997) and Ichino, Polo, and Rettore (2003) investigate the role of courts in affecting the strictness of employment protection legislation. In countries so different, such us West Germany, Italy and U.S., it is shown that the amount of legal provisions increases when the economy is in downturn, since tribunals tend to interpret the law in a way favorable to workers when it is difficult to find job opportunities.

Following these contributions, Bertola, Boeri, and Cazes (1999) propose to revisit the criteria of the EPL index formulated by OECD (1995, 1999), in order to take into account the growing complexity of the employment protection system existing in each country. They emphasize how the strictness of EPL could be affected by the interpretation activity of judges, showing that the higher is the percentage of sentences favorable to workers, the higher is the number of cases taken to court.[2]

In this paper, we provide a microfoundation for the inverse relationship between firing costs and labor market tightness and evaluate its effects on labor market performance in a matching model *à la* Mortensen and Pissarides (1994).

There is a large economic literature concerning the political support for labor market institutions (see for instance Saint-Paul (2001), Saint-Paul (2002), Boeri, Ruiz, and Galasso (2003)). The main attention focus on the behavior of the employed worker (which is the median voter) and on the suitability for some group of workers to support labor market institutions claimed by other groups. The political support for employment protection arises from

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on the French employment protection system.

[2]See also Boeri, Garibaldi, Macis, and Maggioni (2002).

a conflict between insider and outsider, which is able to explain why can be difficult to implement deregulation measures on the labor market.

Our model is also based on a political economy framework. However, our objective is to shed light on the evolution of institutions in the labor market, so that the strictness of employment protection could vary over time and space reflecting the actual labor market conditions, i.e. the difficulties for workers to find a job. As we will show, this can be helpful to individuate the theoretical conditions that can support the empirical literature cited above on a decreasing relationship between firing costs and labor market tightness.

The results obtained are an important generalization of our previous work (Saltari and Tilli (2004)). First, a negative slope of the firing costs function unambiguously arises when the elasticity of the separation rate with respect to firing costs is equal to one, that is when the two opposite effects of layoffs costs on the bargaining wage perfectly compensate. Second, different configurations of the labor market structure deriving from the optimal behavior of the economic agents give rise to multiple equilibria: high average duration of unemployment will produce a labor market with low flows and wage and high strictness of employment protection. Vice versa, short duration in the unemployment status will produce high flows and wage and low level of firing costs. This second result provides a microfoundation for the result obtained in Saltari and Tilli (2004).

The paper is organized as follows. Section 1 describes the labor market while section 2 provides a microfoundation of the firing costs function. Section 3 completes the model on the demand side. Section 4 discusses equilibrium. Finally, section 5 contains some concluding comments.

1 The Labor Market

We now very briefly describe the characteristics of the labor market. The economy is made up of a continuum of risk-neutral workers and firms, which consume all of their income and discount future at a constant rate r. Every worker may be employed or unemployed. When employed, a worker receives a wage w; when unemployed, she enjoys leisure b. Every firm in the market has a job that may be either filled or vacant. If it is filled, the economic activity yields a product y: hence, the profit obtained by the firm is $y - w$. If instead the job is vacant, the firm incurs a cost c for its maintenance.

Unemployed workers and vacancies randomly match according to a Poisson process. If the unemployed workers are the only job seekers and they search with fixed intensity of one unit each, and firms also search with fixed intensity of one unit for each job vacancy, the matching function gives: $h = h(u, v)$ where h denotes the flow of new matches, u is the unemployment rate and v is the vacancy rate.

The matching function is assumed (on the ground of empirical plausibility, see Petrongolo and Pissarides (2001) for a survey) to be increasing and concave in each argument and to have constant return to scale overall.

By the homogeneity property of the matching function, we can define the average rate at which vacancies meet potential partners by the following "intensive" representation: $m(\theta) = \frac{h(u,v)}{v}$ with $m'(\theta) < 0$ and elasticity $-\eta(\theta) \in (-1, 0)$. θ is the ratio between vacancies and unemployed workers and will be interpreted as a convenient measure of the labour market tightness.

Similarly, $\frac{h(u,v)}{u}$ is the probability for an unemployed worker to find a job. Simple algebra shows that $\frac{h(u,v)}{u} = \theta m(\theta)$. The linear homogeneity of the matching function implies that $\theta m(\theta)$ is increasing with θ.[3]

We characterize the EPL as a cost F on job destruction which affects the flows in and out of unemployment.[4] An idiosyncratic shock hits the single firm at rate s. In order to capture the effects of firing costs on hiring and layoffs, we assume that the exit rate from unemployment $\theta m(\theta)$ is affected in a multiplicative way by a function $\phi(F)$, decreasing and linear in F. At the same time, since firing costs also affect layoffs, we assume that the separation rate is a decreasing function of F, $s(F)$, with positive second derivative.[5]

The measure of workers who enter unemployment is $s(F)(1-u)$, while the measure of workers who leave unemployment is $\theta m(\theta) u$. The dynamics of unemployment is given by the difference between inflows and outflows: $\dot{u} = s(F)(1-u) - \theta m(\theta) u$. The unique steady state value of unemployment rate is $\frac{s(F)}{s(F)+\theta m(\theta)}$ showing the dependence of the unemployment rate from the optimal value of F and θ.

Consider the "value" E of being an employed worker. This is defined by the following equation (since attention is restricted to steady state equilibria,

[3]The average durations of unemployment and vacancies are respectively $\frac{1}{\theta m(\theta)}$ and $\frac{1}{m(\theta)}$. This implies that the duration of unemployment decreases with the labour market tightness while the duration of a vacant job increases with θ. The dependence of the two transition probabilities on the relative number of traders implies the existence of a trading externality (Diamond (1982)). During a small interval of time there is a positive probability that a vacant job will not be filled as well as a positive probability that an unemployed worker will not find a job. This probability cannot be brought to zero by any price adjustment. Increasing vacancies causes a congestion on other firms as increasing unemployed job searchers causes a congestion on other workers.

[4]We do not consider the existence of severance payments and their role of insurance against risk.

[5]The assumption on the second derivative of $\phi(F)$ and $s(F)$ are consistent with the empirical evidence. See Boeri, Ruiz, and Galasso (2003).

time subscripts have been dropped):

$$rE = w - s(F)(E - U) \tag{1}$$

An employed worker earns a wage w, but looses her job with the flow probability $s(F)$. In the latter case, her utility jumps down to that of an unemployed worker. In turn, the value U of being an unemployed worker is given by:

$$rU = b + \phi(F)\,\theta m(\theta)(E - U) \tag{2}$$

The unemployed worker earns a flow utility b, given by the value of leisure plus unemployment benefits, if any; further, with probability $\theta m(\theta)$, she finds employment and changes her status.

As for the firm, when it posts a new vacancy, the following Bellman equation must be satisfied:

$$rV = -c + \phi(F)\, m(\theta)(J - V) \tag{3}$$

where V is the value of a vacant job. The firm incurs in a flow search cost equal to c and has a positive probability $m(\theta)$ to fill the job and to jump to the productive state J. In turn, this solves:

$$rJ = y - w - s(F)(J + F - V) \tag{4}$$

Equation (4) states that employing a worker yields a flow profit equal to $y - w$ net of the change in state which occurs with flow probability $s(F)$.

In equilibrium, there is no unexploited profit opportunities, so that the free entry condition holds, $V = 0$. Thus, equation (3) can be rewritten as $J = \frac{c}{m(\theta)}$, that is the value of a filled job must be equal in equilibrium to its expected maintenance cost for the period it remains vacant.

As usual, we assume that the surplus produced by workers and firms is shared by Nash bargaining. The maximization of a geometric average of the surplus weighed with the relative bargaining powers determines the following sharing rule:

$$E - U = \frac{\beta}{1-\beta}\left(J + F - V\right) \tag{5}$$

where β represents the bargaining power of the worker.

Replacing equations (1), (2), (4) and (3) into equation (5), we get the following wage equation:

$$w\left(\theta, F\right) = \left(1-\beta\right) b + \beta \left[y + c\theta - s\left(F\right) F\right] \tag{6}$$

The bargaining wage is an increasing function of the labor market tightness: when it increases, there are more opportunities for worker to find a new job. The effect of the firing costs on wage is instead ambiguous: on one hand, the firm takes into account that it has to pay the firing cost when separation occurs. On the other hand, firing costs reduce the probability to be fired, giving the worker a higher bargaining power.

2 The Firing Costs Function

Our focus is on the political support of employment protection. Since there is only one type of worker, aggregation is trivial: assuming that the number of employed workers is higher than unemployed, the level of employment protection implemented by the political system coincides with the level of firing costs chosen by the employed worker.

The objective of the employed worker is to maximize the profile of her intertemporal consumption with respect to F, that is to maximize V_E.

Subtracting (2) from (1) and substituting into (1), we get:

$$E = \frac{1}{r}\left[\left(1 - \alpha\left(\theta, F\right)\right) w\left(\theta, F\right) + \alpha\left(\theta, F\right) b\right] \tag{7}$$

where $\alpha\left(\theta, F\right) = \frac{s(F)}{r+\phi(F)\theta m(\theta)+s(F)}$ is the proportion of time that a worker will spend unemployed during her lifetime when currently employed.

Maximizing (7) with respect to F, we get the following first order condition (given θ):

$$\left[1 - \alpha\left(\theta, F\right)\right] w_F\left(\theta, F\right) = \alpha_F\left(\theta, F\right)\left[w\left(\theta, F\right) - b\right] \tag{8}$$

where $w_F\left(\theta, F\right)$ and $\alpha_F\left(\theta, F\right)$ denotes the derivative with respect to F of the wage equation and of the unemployment spell, respectively. According to (8), at the margin there must be equality between the benefits and costs caused by a variation of F.

To see this, note that since in (8), since $\left[1 - \alpha\left(\theta, F\right)\right] > 0$ and $\left[w\left(\theta, F\right) - b\right] > 0$, $w_F\left(\theta, F\right)$ and $\alpha_F\left(\theta, F\right)$ must have the same sign. Thus, if $w_F\left(\theta, F\right) > 0$

(< 0) and $\alpha_F(\theta, F) > 0$ (< 0), the employed worker compares the marginal gain (loss) deriving from a higher (lower) wage with the marginal loss (gain) deriving from a higher (lower) duration of unemployment. If $w_F(\theta, F) > \alpha_F(\theta, F)$, the marginal gain increases proportionally more (less) than the marginal loss; hence the worker will choose a higher (lower) level of firing costs.

>From equation (6), we get $w_F(\theta, F) = -\beta[s'(F) F + s(F)]$. Defining the elasticity of $s(F)$ with respect to F as $\epsilon(F) = -\frac{s'(F)F}{s(F)}$, we can rewrite the first order condition in this useful manner:

$$\alpha_F(\theta, F)[w(\theta, F) - b] = [1 - \alpha(\theta, F)]\beta s(F)[\epsilon(F) - 1] \tag{9}$$

In order to evaluate the effects of labor market tightness on the optimal value of F, we totally differentiate equation (8) with respect to F and θ, to get:

$$\frac{dF}{d\theta} = -\frac{\partial V_E^2/\partial F \partial\theta}{\partial V_E^2/\partial F^2} = \tag{10}$$
$$\frac{\alpha_\theta(\theta, F) w_F(\theta, F) + \alpha_F(\theta, F) w_\theta(\theta, F) + \alpha_{F\theta}[w(\theta, F) - b]}{w_{FF}(\theta, F)[1 - \alpha(\theta, F)] - \alpha_{FF}(\theta, F)[w(\theta, F) - b] - 2\alpha_F(\theta, F) w_F(\theta, F)}$$

where $\alpha_i(\theta, F)$ and $w_i(\theta, F)$ are the first derivative with respect to i of the unemployment duration and the wage equation respectively. Analogously, $\alpha_{ij}(\theta, F)$ and $w_{ij}(\theta, F)$ are the second derivative of duration and wage with respect to the variables i and j.

Note that the denominator of equation (10) is negative since the worker is maximizing her lifetime utility, which implies that V_E must be concave in F. Hence, the sign of $\frac{dF}{d\theta}$ depends on the sign of the numerator, that is on the derivative of the first order condition (8) with respect to θ.

Looking at the first order condition (9), when firing costs increase two effects arise: *a)* a direct effect, deriving from a greater expected costs sustained by the firm; *b)* an indirect effect, deriving from a reduction of the separation rate. Note that these two effects work in opposite directions, since the first decreases the wage the firm is willing to pay, while the second gives the worker a higher bargaining power. When the elasticity of the separation rate with respect to F is equal to one, the two opposite effects perfectly compensate. Therefore, the employed worker takes into account only the unemployment duration during the lifetime, disregarding the potential gains or losses in terms of wage.

In such a case, it can be shown that the relationship between firing costs and the labor market tightness is unambiguously negative. In fact, when $\epsilon(F) = 1$, we have only the first term in expression (9), which is negative. Note that this is a sufficient condition to have a negative slope. The other cases corresponding to an elasticity different from one do not necessarily imply a non negative relationship between firing costs and labor market tightness: simply, we cannot establish a priori the sign of the slope of the firing costs function (see the Appendix).

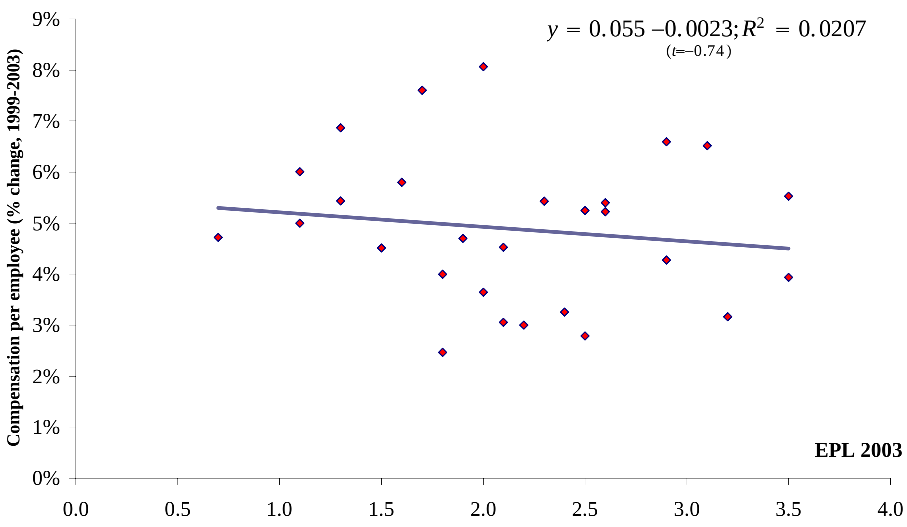
To give an example, assume that $\theta m(\theta) = \theta^{\gamma}$ (deriving from a CRS Cobb-Douglas matching function), $\phi(F) = a - dF$ and $s(F) = \frac{\lambda}{F}$ for the exit rate, the hiring rate and the separation rate. Substituting them into the first order condition, the level of firing cost chosen by the worker is given by:

$$F = \frac{a}{2d} + \frac{r}{2d\theta^{\gamma}}$$

which provides a decreasing relationship between firing costs and the labor market tightness.

In what follows, we focus on the solution of the model with unit elasticity of $s(F)$ for two reasons. First, there is a large empirical evidence, cited in the introduction, that suggests a decreasing relationship between firing costs and labor market conditions. Moreover, we are able to provide a first evidence regarding the correlation between the EPL index formulated by OECD and the percentage variation of compensation per employee. As shown in figure 1, the relationship does not reveal any significant correlation.

FIGURE 1
Correlation between EPL and the percentage change of compensation per employee (OECD source)



3 Job Creation

Remembering the free entry and making use of equation (4), the job creation condition is:

$$w(\theta, F) = y - \frac{[r + s(F)]\, c}{\phi(F)\, m(\theta)} - s(F)\, F \tag{11}$$

which represents a pseudo-labor demand, where the wage the firm is willing to pay is equal to productivity net of the value of search and firing costs times the probability that separation occurs. Looking at the effects of θ and F on the demand wage, it is easy to verify that:

$$\frac{\partial w}{\partial \theta} = -\frac{[r + s(F)]\, c\phi(F)\, m'(\theta)}{[\phi(F)\, m(\theta)]^2} > 0$$

and:

$$\frac{\partial w}{\partial F} = -\frac{s'(F)\, c\phi(F)\, m(\theta) - [r + s(F)]\, c\phi'(F)\, m(\theta)}{[\phi(F)\, m(\theta)]^2} - [s(F) + s'(F)\, F]$$

The effect of θ is standard: higher tightness reduces the probability for firms to fill a vacancy, so it will be willing to pay a higher wage. As for F, the effect is ambiguous: on one hand, the firm takes into account the firing cost in the profit maximization; on the other, higher firing costs reduce job destruction.

4 Equilibrium

Equilibrium is described by four equations: the wage equation, the job creation condition, the firing cost function and the Beveridge curve:

$$w(\theta, F) = (1-\beta) b + \beta [y + c\theta - s(F) F] \tag{12}$$

$$w(\theta, F) = y - \frac{[r + s(F)] c}{\phi(F) m(\theta)} - s(F) F \tag{13}$$

$$\frac{\phi'(F) \gamma(\theta) s(F) - s'(F) [r + \phi(F) \gamma(\theta)]}{r + \phi(F) \gamma(\theta) + s(F)} [w(\theta, F) - b] = 0 \tag{14}$$

$$u = \frac{s(F)}{s(F) + \theta m(\theta)} \tag{15}$$

They jointly determine the equilibrium values of w, θ, F and u.

In order to make clear the characteristics of this equilibrium, it is helpful to equate equations (13) and (12), to obtain:

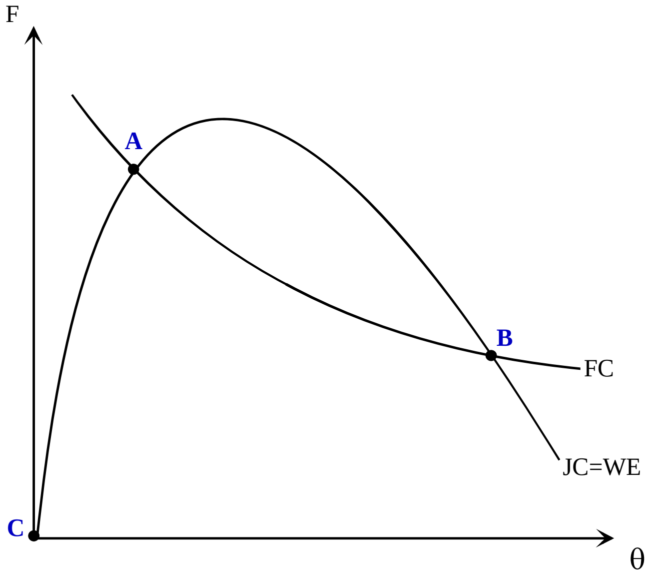
$$(1-\beta)(y-b) - \beta c\theta - \left[\frac{\beta\phi(F) m(\theta) + [r + s(F)]}{\phi(F) m(\theta)} \right] c\theta - (1-\beta) s(F) F = 0 \tag{16}$$

Totally differentiating equation (16) yields:

$$\frac{dF}{d\theta} = \frac{\phi(F) \{\beta\phi(F) m(\theta) + [r + s(F)] [1 + \eta(\theta)]\}}{\{[r + s(F)] \phi'(F) - s'(F) \phi(F)\} \theta} \tag{17}$$

Looking at condition (17), it is easy to note that the relationship between F and θ depends on the interactions between the effect on hiring (captured by $\phi'(F)$) and the effect on separation (as captured by $s'(F)$). By the

FIGURE 2
Multiple equilibria



assumptions we made before on $\phi(F)$ and $s(F)$, it is possible to see that for low level of F the marginal effect on hirings dominates the one on firings. As F keeps increase, the effect on layoffs dominates and more than offsets that on hirings. This means that the relationship between F and θ will be first increasing and than decreasing, which implies the possibility of multiple equilibria, as shown in figure 2.

In figure 2, equilibrium A is characterized by a high level of firing costs and low market tightness, while equilibrium B features low level of firing costs and high tightness. We can interpret the two equilibria as reflecting two different characteristics of the labor market. The endogeneity of firing costs implies that when labor market is thin (the labor market tightness is low), the average duration of a filled job $\frac{1}{s(F)}$ is high (because firing costs are high), but is also high the average duration of unemployment $\frac{1}{\theta m(\theta)}$. When instead labor market is thick (the labor market tightness is high), the average duration of a filled job is low but the worker has a high duration of a filled job (because firing costs are low) but also a high probability to find a new job when unemployed.[6]

Given the two equilibrium values of F and θ, we can derive the equilibrium wage from (12) and the equilibrium unemployment from (15). It should be noted that since firing costs affects the unemployment rate in opposite directions, the two equilibria could produce similar unemployment rates in the model.

5 Concluding Remarks

Institutions change and evolve over time and space. In this paper, we account for this evolution providing a theoretical microfoundation for the relationship between EPL and the tightness of the labor market. This result allows us to study the macroeconomic implications on equilibrium unemployment.

We find that a sufficient condition for the firing costs function to be negatively sloped is when the elasticity of the separation rate with respect to firing costs is equal to one, that is when the direct effect on expected costs (which reduces the wage the firm is willing to pay) and the indirect effect on separation rate (which increases the worker bargaining power) perfectly compensate. This is a sufficient condition for the negative slope. Of course, a negative relationship can also arise if this condition is not satisfied.

[6] This result is coherent with Saltari and Tilli (2004), establishing that the two equilibria are not rankable. In fact, since the median voter is the employed worker, the two equilibria in figure 2 give rise to a trade-off between job tenure and unemployment duration.

There are two main issues for which our analysis is useful and can be extended. The first involves the role of the institutional actors that determine the evolution of institutions. If the job is done by the judges, we should investigate if their behavior can drive towards higher or lower level of efficiency. We think this is essentially an empirical question. The second issue concerns the implications of the reverse causality nexus between EPL and labor market conditions. If the latter affects the former, what determines labor market conditions? We think the answer should be found in the analysis of the interactions between the labor market and the goods and financial markets.

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Appendix

The first derivative of the unemployment spell $\alpha(\theta, F)$ with respect to F is given by:

$$\alpha_F(\theta, F) = \frac{s'(F)\left[r + \phi(F)\theta m(\theta)\right] - \phi'(F)\, s(F)\,\theta m(\theta)}{\left[r + \phi(F)\theta m(\theta) + s(F)\right]^2}$$

It is easy to note that $\alpha_F(\theta, F) > 0$ (< 0) if the marginal effect on hirings (given by $\phi'(F)$) dominates (is dominated by) the marginal effect on firings (given by $s'(F)$).

The first derivative of $\alpha(\theta, F)$ with respect to θ yields:

$$\alpha_\theta(\theta, F) = -\frac{s(F)\,\phi(F)\, m(\theta)\left[1 - \eta(\theta)\right]}{\left[r + \phi(F)\theta m(\theta) + s(F)\right]^2} < 0$$

which is unambiguously negative. In fact, higher θ implies higher job finding rate, that is lower unemployment spell during the lifetime.

Look now at the derivative of $\alpha_F(\theta, F)$ with respect to θ. It can be write in this useful manner:

$$\begin{aligned}\alpha_{F\theta}(\theta, F) &= \frac{[1-\eta(\theta)][s'(F)\phi(F) - s(F)\phi'(F)]}{[r+\phi(F)\theta m(\theta)+s(F)]^2} \\ &\quad -2\phi(F)\frac{\alpha_F(\theta, F)}{[r+\phi(F)\theta m(\theta)+s(F)]}\end{aligned}$$

In this case, if the marginal effect on hirings ($\phi'(F)$) dominates the marginal effect on firings ($s'(F)$), the first term of the expression above is positive. But, at the same time, $\alpha_F(\theta, F) > 0$. Hence, the two terms in the expression work in opposite direction, and it is no possible to state, *a priori*, the sign of $\alpha_{F\theta}(\theta, F)$.