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Analysis of Employment Protection Legislation: a model with endogenous labour productivity.

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Abstract

This paper analyzes the effects of the different Employment Protection Legislation on the workers choices on effort. The different EPL are modelled through an easy theoretical pattern, characterized by endogenous labour productivity. In particular, it is analyzed how the labour productivity is influenced by the incentives that the different EPL give workers. The model outcomes highlight that the recent reforms produce only a positive temporary effect on the unemployment level, as emphasized by the empirical evidence. Finally, this paper analyzes a new contractual regime in order to see if it could offer in theory a better solution in term of structural employment respect to known standard regimes.

- Key Words: Employment Protection Legislation, Effort, Contractual Benchmark.
- JEL Classification: J33, J50, L59.

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1. Introduction

It does not exist institution in the labour market more controversial than EPL (Employment Protection Legislation), meant as the whole legislation that disciplines the relationship between firms and workers in the crucial phases of hiring and dismissal.

The economic science, but also the main international economic organizations, agree already for much time on relevance of all institutions operating in the labour market to determine the employment level in the economic system. Consistently with this point of view, in the last years the economic research in this topic has concentrated his efforts on the analysis of the effects of EPL on employment and productivity level. Moreover, a heavy impulse is come from the outcomes in term of employment in European countries immediately afterwards the reforms of institutional regimes, most which have liberalized the flexible contracts.

The EPL literature has been very vivacious since the early ninety years. The first important result dates back to pioneer contribution of Bentolila and Bertola (1990), where the authors show, through the development of a labour demand model with uncertainty, that in a fixed wages system the EPL are not neutral, because they cannot be internalized thanks to the flexibility of wages, however their effect on the structural employment is of second order¹. In particular, the authors find that when there are firing cost firms reduce less the employment in order to response to negative shock and increase less one to response to positive shock. Therefore, the authors conclude that the presence of firing cost can explain the poor reactivity of employment in Europe during the economic recovery, but it is not fit in itself to make the high level of unemployment clear. From this publication is started a very profitable research in this topic. Important is the contribution of Schivardi (2000), where the author highlights three important results: the average employment of long-run is the same in a rigid R and in a flexible country F; the volatility of employment, that is the flows in and out the employment, is much higher in a flexible regime F; a flexible country is more efficient². These important results, despite are consistent with the empirical evidence on the structural employment levels, they do not offer a possible explanation of the employment dynamic determined by the recent flexible reforms. This gap has been covered by the contribution of Boeri and Garibaldi (2005), where the authors point out the so-called “Honeymoon Effect” which appears with the introduction of flexible regime, as it has appeared in the European countries after the last reforms of labour market institutions. In particular, the authors find that the initial effect of the marginal flexible reform is a transitional increase in employment together with a much less relevance increase of product; this should be given by a fall in average labour productivity which leads in the long-run the employment level to the pre-reform level³.

¹ See Bentolila, S. and Bertola, G. (1990);

² See Schivardi, F. (2000);

³ See Boeri, T. and Garibaldi, P. (2005);

Despite every contribution has its peculiarity, all these papers have the common characteristic to focalise the analysis exclusively in the firm labour demand, considering the labour productivity as an exogenous variable of the model. Even the Boeri and Garibaldi model (2005), despite it finds a fall of average labour productivity, it do not offer a micro-founded explanation of this effect.

The model developed in this paper tries to insert in the analysis of EPL the study of the effects that the different regimes have on the level of effort chosen by worker. Consequently, an important peculiarity of the model is to consider the labour productivity as an endogenous variable, influenced indirectly by the different protection regimes. This inclusion allow us to identify one possible micro-founded explanation of the indirect effects of EPL on the employment level.

The assumption that the labour productivity is influenced by the different institutional roles is indeed consistent with many line of research of economic literature. Certainly this assumption is the foundation of the *efficient wages theory*, according to which the firms can be interested to offer their workers a wage higher than the market one both to avoid the *adverse selection* cost in the selection procedure and to increase the *opportunity cost* to lose job, giving workers an incentive to increase their effort, in this way increasing the firm productivity⁴.

More, this assumption is the foundation of the study on the *staff optimal manage*, where other instruments to incentive workers are been highlighted not only of retributive nature, such as kinds of decisional participation, share options, promotion strategies and so on.

Despite every line has its crucial focus, all these ones have a common aim to identify the roles that offer the better incentives to employee relationship. On this matter, a fundamental contribution is the *principal-agent theory*, which analyses the problem of asymmetric information in the relationship between firms and workers. A detailed analysis of this problem is in Arrow (1963) where the author outlines that in those work, often un-skilled, where exist objective criteria to define and measure the performance of workers is optimal for both the firms and the society to establish a performance wages, keeping the time wages only for those works for which is impossible to define the individual performance⁵. Several papers highlight that the system of performance wages has had a good empirical evidence, especially in the United State⁶.

From these considerations we can infer that the different EPL, regardless of the retribution system used and the staff manage strategy, influence the labour productivity already cause they include different contractual deadlines.

This paper intend firstly to insert in EPL literature the analysis of the workers decisional process on effort, in order to identify the indirect effects that EPL have on the employment level. Besides, it tries to identify a contractual regime alternative to two main regimes, rigid with permanent contracts and flexible with temporary contracts, which be convenient for the both parts of the labour market and, at the same time, be proposable in term of political economy. This alternative regime should be drawn in a way to:

⁴ See Solow, R.M. (1979);

⁵ See Arrow, K.J. (1963);

⁶ For all see Lazear, E.P. (1996);

- avoid the rigidities that the permanent contracts insert in the decisional process of firms on hiring;
- incentive workers to increase the level of effort in their work;
- incentive the parts to keep longer relationships.

The contractual regime analysed, called “benchmark contractual regime”, looks reply positively to characteristics required. The main peculiarity of this regime is to fix a contractual benchmark with respect to worker performance which, in case it is caught, forces firm to renew a contract to worker, who receives a longer contract.

2. The rigid and flexible regime

2.1 The model

In this paper it is proposed an extension of Schivardi (2000) and Boeri and Garibaldi (2005) model⁷, introducing some peculiar hypotheses.

The main purpose of this paper is to analyse the worker decisional process on effort and, in particular, indentify if the different EPL offer workers diverse incentives, determining different effort and employment level.

The main object of the analysis, set in a partial equilibrium context, are the demand labour of a representative firm and the decisional process on effort of a representative worker in two different institutional context.

The hypotheses kept from the original model are:

- there are two countries, {R, F}, the first one characterizes by a rigid institutional regime, where the contracts are permanent and it is extremely expensive to interrupt them, and the second one characterized by a flexible institutional regime, where the contracts are temporary, it is extremely expensive interrupt them as well, but there is not any obligation in order to carry on with the employee relationship after the expire date.
- in every country there is only one firm which makes only one good;
- there is not natural turnover⁸;
- the wage is fixed and it is the same in both countries ($W = W^{R,F}$);
- the price of good for simplicity is makes equal to 1 ($P = 1$);

⁷ See Schivardi, F. (2000), and Boeri, T. and Garibaldi, P. (2005);

⁸ It is superfluous to say that this hypothesis is absolutely unrealistic, given that workers have not infinite life, however, for our proposals to introduce natural turnover represents an useless complication of the model and, besides, it does not offer other intuitions to the results The only way for which it results useful to take into account natural turnover is consider, in the passage from a regime to another one, that in the long-run there will be more workers hired with the new contracts;

- the two firms have the same production function

$$y = A \log L$$

where L is labour, y output and A the labour productivity. Hence, labour is the only productivity factor and it has decreasing marginal returns.

The hypotheses introduced in this paper are:

- the firms are not able to foresee demand and technological shocks. Consequently, in country R the firm considers another labour cost, given by extremely difficult to modify the labour stock to reply the different shocks that could happen. Moreover, this ulterior cost should be interpreted also as the difficult to react to small worker productivity after that he is hired, given by the high cost to interrupt a permanent contract. This cost, which can be called with the general expression “rigidity cost”, in the model is indicated with m . Indeed, there are not reasons to consider this cost in country F, where the firm can modify in every contractual period the labour stock;
- the labour productivity at time t depends on the effort of workers, so $A_t = f(e_t)$, with $(\partial A/\partial e) > 0$, where $e = \text{effort}$ ⁹;
- when firms choose L_t they consider $A_t = A_{t-1}$ (static expectation). This hypothesis is very realistic given that firms normally do not risk to hire workers considering a productivity level significantly different with respect to previous one. This imply that, in the passage from a contractual regime to another one, it is possible in the short-run that firms expectation on productivity level should not be confirmed. Obviously, in the long-run firms adjust their expectation, so effective productivity level will be equal to expected one.

Illustrated the model assumptions, we can proceed to analyse the different institutional regimes.

2.2 The rigid regime

The first regime considered is the rigid regime. The main peculiarities of this regime are that the contracts are permanent and firing is possible only for fair reason and, because of several administrative passages required, it is extremely expensive for the firm. Hence, when the firm chooses the labour stock it considers an ulterior cost, so-called “rigidity cost” m , which is given by the difficult to modify the labour stock in order to reply to unexpected demand and technological shocks and to small productivity of hired workers.

The firm considers the following profit function:

$$\pi_t = A_t \log L_t - w L_t - m L_t$$

The first order conditions allow us to derive the employment level in the rigid country R:

⁹ In Schivardi (2000) and Boeri and Garibaldi (2005) model the labour productivity is considered as an exogenous variable, while in this paper it is considered as endogenous and, in particular, it is influenced by the different institutional regimes;

$$\max_L \pi \rightarrow \frac{\partial \pi}{\partial L} = \frac{A^R}{L} - w - m = 0$$

$$\bar{L}^R = \frac{A^R}{(w + m)}$$

It is easy to verify that:

$$\left(\frac{\partial \bar{L}^R}{\partial A^R} \right) = \frac{1}{(w + m)} > 0;$$

$$\left(\frac{\partial \bar{L}^R}{\partial w} \right) = - \frac{A^R}{(w + m)^2} < 0;$$

$$\left(\frac{\partial \bar{L}^R}{\partial m} \right) = - \frac{A^R}{(w + m)^2} < 0.$$

These results are very intuitive. Indeed, it is reasonable to expect that when labour productivity A goes up, going up the revenues, *ceteris paribus* firm hires more workers, while it hires less ones if wage w and rigidity cost m go up, going up the costs.

Instead, it is more interesting to see how labour productivity A is determined. We have assumed that labour productivity is an increasing function of the effort of worker. He, after being hired, chooses how much to devote hard to work maximizing his utility function. However, worker is not free to choose any effort level when He maximizes his utility. Indeed, despite for the firm it is difficult and expensive to fire it, however it does exist a productivity threshold level under which the firm considers optimal to fire it for fair reason. If worker chooses a effort level so that it does not risk to lose his job, given the characteristics of rigid regime, he is sure to keep his job for all life, does not having to worry to devote much more in order to convince firm to carry on the employee relationship. Because of the stability of the contracts, the distinction between skilled worker and un-skilled worker, about the decisional process on effort, has not any relevance in this regime.

Thus, the decisional problem of worker is a standard maximization problem subject to two inequational constraints¹⁰. The utility function of worker hired is the following:

$$U(w, l, e) = \begin{cases} f(w) + \log\left(\frac{l}{e}\right), & e \geq e^S \\ \log\left(\frac{l}{e}\right), & e < e^S \end{cases}$$

where l = leisure, e = effort and $f(w)$ is a generic function of wage with $\frac{\partial f}{\partial w} > 0$ and $\frac{\partial^2 f}{\partial w^2} < 0$. It is easy to see that the utility of worker is an increasing function of leisure and a decreasing function of effort, which is extremely reasonable. The worker maximizes his utility subject to two constraints:

$$\max_{(l,e)} U(w, l, e) = f(w) + \log\left(\frac{l}{e}\right)$$

$$s. t. : \begin{cases} l + e = T \\ e \geq e^S \end{cases}$$

¹⁰ With reference to the decisional process of worker in literature it has been always analyzed the decision on labour supply, with a wage proportional to the labour quantity. In this paper it is analyzed the decision of worker hired on the effort level, supposed that the wage is not proportional to the effort, and it could be lost in case the worker is fired. In this perspective, does not losing the wage must be handled as a constraint that the worker considers when he chooses the effort level that maximizes his utility;

where the first constraint is easily the time constraint which imposes that the sum of leisure and effort is equal to T (for example, in a daily view $T = 24$ hours), and the second one is the condition to keep job with $e^S =$ threshold level under which for the firm it is optimal to fire worker.

The Kuhn-Tucker conditions allow us to derive the effort level and, consequently, the labour productivity level in the rigid country R:

$$\bar{l}^R = (T - e^S) \wedge \bar{e}^R = e^S.$$

It is the only solution of this problem, because the result of the maximization process in case of inequational constraint ($\lambda_2 = 0$) cannot be accepted, does not respecting the condition $e \geq e^S$.

This result is confirmed by the graphical analysis of the problem. As highlighted in Figure 1, the whole of possible choices, which are the choices that respect both two constraints, is represented by the shadowed area. The curves U^1, U^2, U^3 e U^4 are the indifferent curves and it is easy to verify that these curves have utility level decreasing from 1 upwards. So, the utility curve lower which respects the constraints is U^3 , exactly in correspondence with the point $l^* = T - e^S \wedge e^* = e^S$.

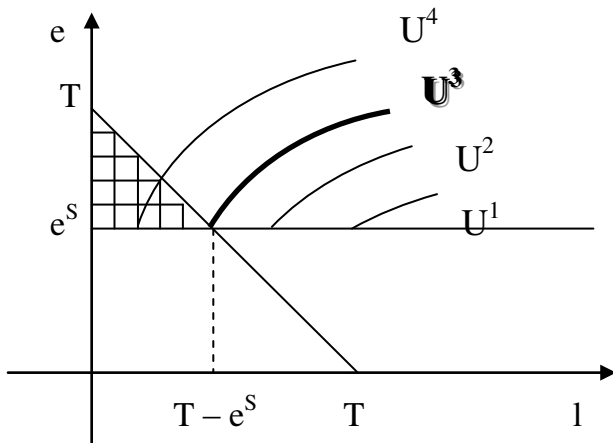


Figure 1 – Effort level

The clarity of the threshold level notion, that is the productivity level so much low that it makes firing optimal for the firm, allow us to identify easily the level e^S . For simplicity we consider only two periods: the first year and all next ones. For the firm it is optimal to fire worker if the expected value of the cost to keep worker, minus firing cost, is greater than the expected value of the revenue derived by labour product. Thus, the threshold level is the effort level that equalizes marginally these two values:

$$\sum_{j=1}^2 w (1 + i)^{-(j-1)} = \sum_{j=1}^2 \{ [A(e) \log(L) - A(e) \log(L - 1)] [(1 + i)^{-(j-1)}] \} + fc$$

with $fc =$ firing cost, from which:

$$\bar{e}_R^S = A^{-1}(e) \frac{w - fc \left[\frac{(1 + i)}{1 + (1 + i)} \right]}{\log\left(\frac{L}{L - 1}\right)}$$

Therefore, the labour productivity in the rigid regime R is:

$$\bar{A}^R = f(\bar{e}_R^S);$$

the employment is:

$$\bar{L}^R = \frac{\bar{A}^R}{(w+m)}$$

and the profit of the firm is:

$$\bar{\pi}^R = \bar{A}^R \log \bar{L}^R - w \bar{L}^R.$$

2.3 The flexible regime

The second regime considered is the flexible regime. The main characteristic of this regime is that the contracts are temporary, thus the firm does not discount any future conditions when it decides the labour stock, as in the rigid regime, given that it can choose the optimal employment level in every contractual period. There is not any obligation to carry on the employee relationship with workers after the expire date. Consequently, the firm chooses if to keep the relationship at the expire date only taking into account its interest. However, if the new contract is stipulated the institutional regime fixes a longer contractual duration. Even in this regime the worker can be fired only for fair reason, and it is very expensive too¹¹.

The firm has the following profit function:

$$\pi_t = A_t \log L_t - w L_t$$

where is easy to see the disappearance of m , given by the change of the institutional regime¹².

The first order conditions allow us to derive the employment level in the flexible regime F:

$$\max_L \pi \rightarrow \frac{\partial \pi}{\partial L} = \frac{A^F}{L} - w = 0$$

$$\bar{L}^F = \frac{A^F}{w}$$

The worker hired decides the effort level. Even in this case the worker has to respect time constraint ($l + e = T$) and threshold effort level constraint under which he is fired and loses the wage w ($e \geq e^S$). However, it is could be maintained that in this regime worker takes into account also the possibility that the firm stipulates him a new contract, which obviously increases his utility given that in this way he obtains the wage of the new contract. This aspect is not contemplated in the rigid regime because, at least if worker is not fired for fair reason, the stability of the relationship is fixed by the contract. Different situation is in the flexible regime, where the worker should can influence the continuity of employee relationship, that is the probability p that firm decides to renew the contract. In order to understand if the assumption $p = f(e)$ is acceptable we

¹¹ The characteristics of the flexible regime assumed in the model seem to correspond with the ones of the fixed-term contracts. Obviously in the real world the obligation of the increase in wage (or of the increase in contractual term) in case of renew of the contracts is less stylized than in the model. Nevertheless, the tendency of the legislation in the European Country is to avoid that the firms renew the contracts with the same conditions for several times;

¹² The disappearance of the cost m seems quite justified in the flexible regime. In fact all the elements considered with respect to the rigid regime, they do not have to be considered in the that flexible;

must analyse how the firm chooses to carry on an employee relationship. Surely each choices imply both benefits and costs to firm, so is reasonable to expect that the firm takes its optimal choice confronting the two alternative. The firm has interest to stipulate the new contract to old worker when the cost of old worker is lower than the cost to hire a new worker:

$$w(1 + \alpha) < w + sc + tc + hc$$

where w = wage;

α = greater cost, given by contractual obligation;

sc = search cost;

tc = training cost;

hc = human capital lost.

If the firm takes its decision on contractual stipulation in this way is appropriate to distinguish between skilled labour and unskilled labour. For the first it looks acceptable the assumption $p = f(e)$ for two reasons: firstly, the effort of skilled worker increases the hiring cost of a new worker in term of human capital lose hc into worker¹³; moreover, for the skilled labour both the search cost sc of a new worker which have the qualifications required, and the training cost tc can be very significant¹⁴. Thus, it is reasonable for the firm to renew the contract to a worker which has reached good results in term of productivity despite the greater cost imposed by the institutional regime. However, it must be said that the productivity of skilled workers depends on elements which have very little to do with the institutional regime, but they have more to do with instruction level, personal ambitions, and so on. Hence, both the aim of this paper to identify the incentives of different institutional regimes, and the analytical context, characterized by a fixed wage and that kind of utility function of worker, they do not look to have much to do with the skilled labour.

Different story is for the unskilled labour. Indeed, in this sphere it is reasonable to presume that search cost sc and training cost tc are not really relevant, given that the mansions done by unskilled worker generally can be done by every workers without any particular qualifications or skills. Moreover, the human capital of an unskilled worker can be considered irrelevant or easily replicable¹⁵. Consequently, for the firm is optimal to hire a new worker, given that it has to sustain a labour cost smaller than for the old worker. Thus, for the unskilled labour the assumption $p = f(e)$ cannot be accepted, given that for the firm is optimal always and at every expire date to hire a new worker.

Consequently, the utility function of worker is still the following:

$$U(w, l, e) = \begin{cases} f(w) + \log\left(\frac{l}{e}\right), & e \geq e^S \\ \log\left(\frac{l}{e}\right), & e < e^S \end{cases}$$

¹³ The skilled worker in fact, unlike the unskilled worker, is often put to accomplish multidimensional tasks, where learning and experience represent important factors for a well-done result. These factors assume less importance for the unskilled labour, where the worker is put to accomplish simple mansions;

¹⁴ The research of skilled workers can imply relevant costs concerning the difficulty to find the worker with the adequate qualifications and experience; moreover, to train a worker, even if skilled, to accomplish a complex task can imply high costs as well (for instance, there are many big firms that begin to pay their workers since the training periods). For the unskilled labour all these considerations have a lower weight;

¹⁵ See notes 13-14;

Even here the worker has the time constraint ($l + e = T$) and the threshold effort level constraint under which for the firm is optimal to fire him and he loses the wage ($e \geq e^S$):

$$\begin{aligned} \max_{(l,e)} U(w, l, e) &= f(w) + \log\left(\frac{l}{e}\right) \\ \text{s. v. : } &\begin{cases} l + e = T \\ e \geq e^S \end{cases} \end{aligned}$$

The Kuhn-Tucker conditions allow us to derive the effort level and, consequently, the labour productivity in the flexible country F:

$$\bar{l}^F = (T - e^S) \quad \wedge \quad \bar{e}^F = e^S.$$

Initially the effort level of unskilled worker in the flexible regime could look the same of the effort level in the rigid regime. Indeed, the threshold level under which for the firm is optimal to fire worker is greater in the rigid regime than in the flexible one. In this regime there is only one period and it corresponds to contractual period:

$$w = [A(e) \log(L) - A(e) \log(L - 1)] + fc$$

from which:

$$\bar{e}_F^S = A^{-1}(e) \frac{w - fc}{\log\left(\frac{L}{L-1}\right)}$$

Comparing this effort level to the threshold level of the rigid regime e_R^S is easy to see:

$$\begin{aligned} fc \left[\frac{(1+i)}{1+(1+i)} \right] < fc \quad \rightarrow \quad \frac{w - fc \left[\frac{(1+i)}{1+(1+i)} \right]}{\log\left(\frac{L}{L-1}\right)} > \frac{w - fc}{\log\left(\frac{L}{L-1}\right)} \quad \rightarrow \\ A(e_R^S) > A(e_F^S) \quad \rightarrow \quad e_R^S > e_F^S \end{aligned}$$

Indeed, it was enough reasonable to expect this result. In particular, the main intuition is that in the flexible regime, being the keeping cost reduced by the temporary contracts, the firm could also considers convenient to avoid the firing cost and attend the expire date of the contract. This alternative is excluded in the rigid regime, where the contracts are permanent, increasing the keeping cost of a worker less productive. Consequently, the effort level e^S needed so that the firm decides against firing worker in the rigid regime have to be greater.

Therefore, the labour productivity in the flexible regime F is:

$$\bar{A}^F = f(\bar{e}_F^S);$$

the employment is:

$$\bar{L}^F = \frac{\bar{A}^F}{w};$$

and the profit of the firm is:

$$\bar{\pi}^F = \bar{A}^F \log \bar{L}^F - w \bar{L}^F.$$

2.4 The comparison between rigid and flexible regime

After the analysis of the two institutional regimes, now we are able to derive several important implications of the model on the effect of EPL, in order to identify what regime offers a better result in term of employment level:

- the labour productivity in the rigid regime R is greater than in the flexible regime F;
- the employment level in the rigid regime R is almost the same than in the flexible regime F;
- the employment variability is greater in the flexible regime F;
- the firm in the flexible regime F are more efficient than in the rigid regime, but the profit is almost the same in the two regimes.

For the productivity level A , we have already seen as in the rigid regime the workers are more productive than in the flexible regime:

$$\bar{e}_R^S > \bar{e}_F^S \quad \rightarrow \quad \bar{A}^R = f(\bar{e}_R^S) > \bar{A}^F = f(\bar{e}_F^S)$$

For the employment level L , the results of the analysis highlight two differences which influence the employment in a opposite way: on one hand the flexible regime deletes the “rigidity cost” m present in the rigid regime, due to different life of the contracts in the two regimes, raising the employment; on the other hand the lower labour productivity in the flexible regime leads the firms to reduce the labour demand. Therefore, the result of the comparison on the employment L is ambiguous:

$$\bar{L}^R = \frac{A^R}{(w+m)} \cong \bar{L}^F = \frac{\bar{A}^F}{w}.$$

Nevertheless, surely the variability of the employment, that is the flows in and out the occupation, is much higher in the flexible regime. To show this we assume that there is a technological cycle (or a demand) where in the first stage there is an expansion of the technological constraint (or of the demand) from $\log L$ to $\log L^2$ (that is a greater marginal productivity of labour), whereas in the next stage there is a contraction of the technological possibilities again to $\log L$. In the rigid regime R, owing the characteristics of the contracts, there are not temporary fluctuations of the employment connected to the different stages of the cycle, but there are only structural changes unrelated to the trend. In the flexible regime F, owing that the firm can choose the labour stock in every contractual period, the employment changes from: in the expansion stage $\Delta L = 2 \frac{\bar{A}^F}{w} - \frac{\bar{A}^F}{w} = \frac{\bar{A}^F}{w}$, with the employment level equal to $\bar{L} = 2 \frac{\bar{A}^F}{w}$; in the contraction stage $\Delta L = \frac{\bar{A}^F}{w} - 2 \frac{\bar{A}^F}{w} = -\frac{\bar{A}^F}{w}$, with the employment level equal to $\bar{L} = \frac{\bar{A}^F}{w}$.

This result affects both the utility of being employed and the disutility of being unemployed. In particular, on one hand in the rigid regime the utility of being employed is greater than one in the flexible regime, given that it is more difficult to become unemployed; but on the other hand in the rigid regime the disutility of being unemployed is greater as well, given that it is more difficult to find a work.

Finally, for the efficiency without doubt in the flexible regime F the firms are more efficient, owing that they can choose in every period the optimal labour stock:

$$\bar{L}_t^F = \text{Argmax}_L \{ \bar{A}^F \log(L) - wL \} \quad \forall t.$$

The firms in the rigid regime, just because of the impossibility to modify the labour stock (“rigidity cost” m), are constantly in a suboptimal condition:

$$\bar{L}_t^R \neq \text{Argmax}_L \{ \bar{A}^R \log(L) - wL \} \quad \forall t.$$

However, the firms in the rigid regime R take advantage of a labour productivity greater than one in the flexible regime F, $\bar{A}^R = f(\bar{e}_R^S) > \bar{A}^F = f(\bar{e}_F^S)$. Therefore, being two effects with opposite direction, the comparison on the profits π is ambiguous.

To sum up, the results of the comparison between the two regimes are the following¹⁶:

- the labour productivity A is greater in the rigid regime;
- the result on the average employment is ambiguous (see Fig. 2). However, the flows in and out the employment are larger in the flexible regime;
- the firms in the flexible regime choose the labour stock in every period more efficiently, but their efficient is damaged by the lower labour productivity.

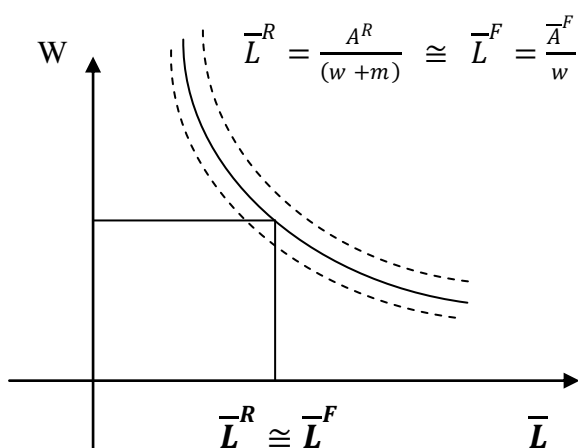


Figure 2 – Employment level in the two regimes

2.5 The passage from the rigid to the flexible regime

The analysis of the two standard institutional regimes, and the comparison between them, have led to the conclusion that the long run average employment in the two regimes is the same. This conclusion would seem at first view it is inconsistent with the data, which point out that in all European Country where there was a labour market reform towards a greater flexibility there was an increase in employment. However, the analysis of the passage from one regime to another give us a convincing explanation of this increase.

In this transitional period from one regime to another the firm has the following profit function:

¹⁶ See Schivardi, F. (2000), and Boeri, T. and Garibaldi, P. (2005), where the authors arrive at the same conclusions, even if through a different way;

$$\pi_t = A_{t-1} \log(\bar{L}^R + L^F) - w \bar{L}^R - w L^F$$

where \bar{L}^R is the employment level before the liberalization of the flexible contracts, which cannot be modified. The labour productivity considered by the firm is the productivity of the previous period, that is the productivity of the rigid regime $A_{t-1} = A^R$.

The firm maximizes the profit choosing only the flexible labour stock L^F :

$$\max_{L^F} \pi \rightarrow \frac{\partial \pi}{\partial L^F} = \frac{A^R}{(\bar{L}^R + L^F)} - w = 0$$

$$\text{from which } \bar{L}^F = \frac{A^R}{w} - \bar{L}^R$$

Hence, at the introduction of the flexible regime the total employment becomes:

$$\bar{L}^I = \bar{L}^R + \bar{L}^F = \bar{L}^R + \frac{A^R}{w} - \bar{L}^R = \frac{A^R}{w}$$

Therefore, the introduction of the flexible regime produces an employment greater than the previous level. In fact:

$$\bar{L}^I = \frac{A^R}{w} > \frac{A^R}{(w+m)} \cong \frac{A^F}{w}$$

Nevertheless, as soon as the system assimilates the changing of the institutional regime, in the long run there will be unavoidably 3 effects:

- there will be more and more workers hired with flexible contracts; and from this;
- the labour productivity will get more and more the productivity of the flexible workers ($A \downarrow \rightarrow A^F$)¹⁷;
- the firms will adjust their expectations on labour productivity.

Thus, in the long run the employment comes back to the previous level:

$$\bar{L}^F = \frac{A^F}{w} < \frac{A^R}{w} = \bar{L}^I$$

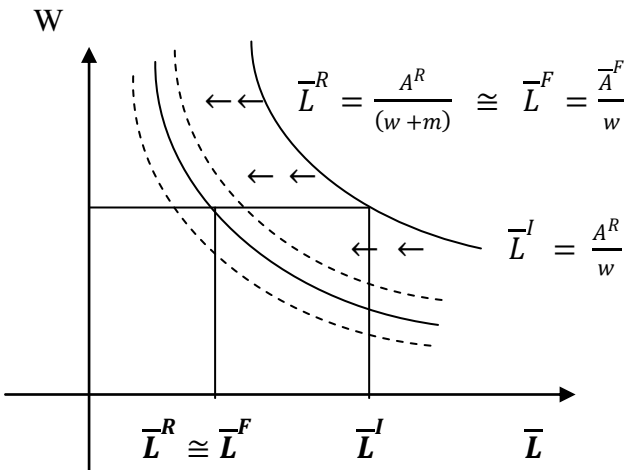


Figure 3 – Honeymoon Effect

¹⁷ Both the effects depends exclusively on the fact that for the firm is more and more convenient to hire with fixed-term contracts; therefore, owing to the exhaustion of the generation of permanent workers and given that all new workers are hired with fixed-term contracts, there are the two effects;

Finally, as it is showed in Figure 3, the introduction of the flexible regime generates a temporary increase in employment. However, exhausted the “Honeymoon Effect”, the employment returns to the previous level. Indeed, this effect is due to a decrease in labour productivity A^{18} .

2.6 The mixed regime

In this paragraph it is analyzed another institutional regime, called mixed regime. The most important characteristics of this regime are that the contracts are permanent (like the rigid regime), but the firing is possible in every moment and for every reason and it does not imply any cost for the firm¹⁹. Consequently, in this regime when the firm chooses the labour stock it does not consider the “rigidity cost” m , given the possibility to fire the workers less productive and to respond to changes of demand and technology without any additional cost.

The firm has the following profit function:

$$\pi_t = A_t \log L_t - w L_t$$

The first order conditions allow us to derive the employment level in the mixed regime M:

$$\begin{aligned} \max_L \pi &\rightarrow \frac{\partial \pi}{\partial L} = \frac{A^M}{L} - w = 0 \\ \text{from which } \bar{L}^M &= \frac{A^M}{w} \end{aligned}$$

The labour productivity level A is determined by the choice of worker on the effort. Even in this case the decisional problem of worker appears as a standard maximization problem subject to inequational constraint. The worker is not able clearly to influence the firm choices on firing when they are due to technological or demand shocks. However, the worker can influence significantly the firm advantage to fire for unproductiveness reason. The utility function of worker hired is:

$$U(w, l, e) = \begin{cases} f(w) + \log\left(\frac{l}{e}\right), & e \geq e^S \\ \log\left(\frac{l}{e}\right), & e < e^S \end{cases}$$

The worker maximizes his utility subject to usual constraints:

$$\begin{aligned} \max_{(l,e)} U(w, l, e) &= f(w) + \log\left(\frac{l}{e}\right) \\ \text{s. v.: } &\begin{cases} l + e = T \\ e \geq e^S \end{cases} \end{aligned}$$

The Kuhn-Tucker conditions allow us to derive the effort level and, consequently, the labour productivity in the mixed regime M:

$$\bar{l}^M = (T - e^S) \quad \wedge \quad \bar{e}^M = e^S.$$

To identify the exact level of e_M^S we consider 2 period: the first year and the next ones. For the firm it is optimal to fire worker if the expected value of the cost to keep worker is greater than the expected value of

¹⁸ See Boeri, T. and Garibaldi, P. (2005);

¹⁹ The characteristics of this institutional regime corresponds exactly to a reform which reduces the protection for the permanent contracts, just as it has been in the nineties in Spain and in Portugal, and as it has been always in the United States;

the revenue derived by labour product²⁰. Therefore, the threshold level is the effort level that equalizes marginally these two values:

$$\sum_{j=1}^2 w (1+i)^{-(j-1)} = \sum_{j=1}^2 \{ [A(e) \log(L) - A(e) \log(L-1)] [(1+i)^{-(j-1)}] \}$$

from which:

$$\bar{e}_M^S = A^{-1}(e) \frac{w}{\log\left(\frac{L}{L-1}\right)}$$

Therefore, the labour productivity in the mixed regime M is:

$$\bar{A}^M = f(\bar{e}_M^S) > \bar{A}^R = f(\bar{e}_R^S) > \bar{A}^F = f(\bar{e}_F^S) \quad \text{given that } \bar{e}_M^S > \bar{e}_R^S > \bar{e}_F^S$$

the employment is

$$\bar{L}^M = \frac{\bar{A}^M}{w} > \bar{L}^R = \frac{\bar{A}^R}{(w+m)} \cong \bar{L}^F = \frac{\bar{A}^F}{w}$$

and the profit of the firm is:

$$\bar{\pi}^M = \bar{A}^M \log \bar{L}^M - w \bar{L}^M > \bar{\pi}^R = \bar{A}^R \log \bar{L}^R - w \bar{L}^R \cong \bar{\pi}^F = \bar{A}^F \log \bar{L}^F - w \bar{L}^F$$

Finally, the results of the comparison with the other regimes are the following:

- the labour productivity is greater in the mixed regime compared to the other regimes;
- the average employment is greater in the mixed regime compared to the other regimes (see Fig. 4);
- the efficiency of the firms is greater in the mixed regime compared to the other regimes.

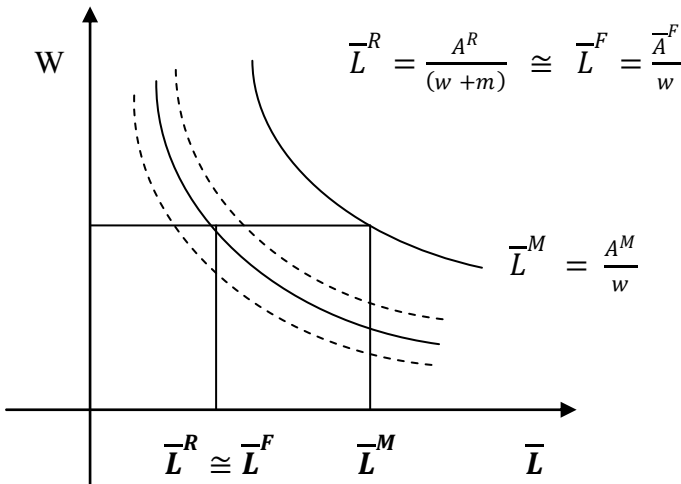


Figure 4 – Employment level in the mixed regime

²⁰ Notice the disappearance of the firing cost fc , due to the characteristics of the institutional regime;

3. The empirical evidence

The empirical analysis of the EPL effects ever since its development has presented several methodological problems not easy to solve. The first problem, so far only partially solved, consists of the difficulty to measure the rigidity grade of an institutional system, owing the presence of many elements that contribute to bring it about. To solve this problem, in order to be able to do international comparisons, it was resorted to the so-called method “*hierarchies of the hierarchies*”, which consists of assign a grade (for instance from 1 to 6) to every country with respect to every element fit to affect the rigidity grade of the system. Averaging the different components, so it is obtained the synthetic index of rigidity. Despite this method has been of great help, it is clear that the numerousness of the elements in the different legislations of the Countries implies an ambiguity to choose what elements are more effective, or even if the same element is effective in the same manner in Countries with different structural characteristics.

Another problem not easy to solve consist of take into account the lags that elapse between the institutional reforms and the production of their effects in the labour market. Even in this case it is problematic to identify precisely the interval, given that different Counties could quite easily imply different reaction times of the labour market²¹.

Therefore, for these problems it is necessary much prudence to interpret the empirical evidence and draw definitive conclusions. However, the purpose of this paragraph is to point out same “stylized fact” that emerge from the empirical evidence, in order to offer a preliminary evaluation of the model analyzed in this paper.

In the recent years the institutional regimes, and more precisely the contractual regimes, of the main European Countries have had some significant changes. However, the main reforms have the common characteristic to not touch the roles for the workers hired pre-reforms, instead affecting deeply the regime for the workers post-reform. This asymmetry has produced the unpleasant consequence of a dual labour market, characterized by inequality of treatment, an efficiency of the system only partial and a remarkable redistributive effect all in favour of the workers pre-reform that have taken advantage of the trade-union protection during the phases of the change and against the new workers and the new generations.

This asymmetric institutional change of the main European Countries can be grasped by the figures 5 – 6²².

In the first figure is immediate to note that from the eighties to nowadays in all Countries the regulation of permanent contracts has not been changing. At this Spain and Portugal constitute an exceptions, which respectively in 1997 and in 2001 modified the regulation also of permanent contracts. Furthermore, from the chart is easy to learn that the index of regulation of permanent contracts in the United States is the smallest.

²¹ For a more detailed treatment of these problems, see Bertola (1990), Grubb and Wells (1993) and OECD (1999d);

²² The search is European Commission;

The second graphic points out that with reference to the fixed-term contracts there have been several changes in the European Countries. Hence, even from the analysis of these graphics we can observe that the strategy of the main Countries has been to keep unchanged the regulation of the permanent contracts, and to liberalize the fixed-term contracts.

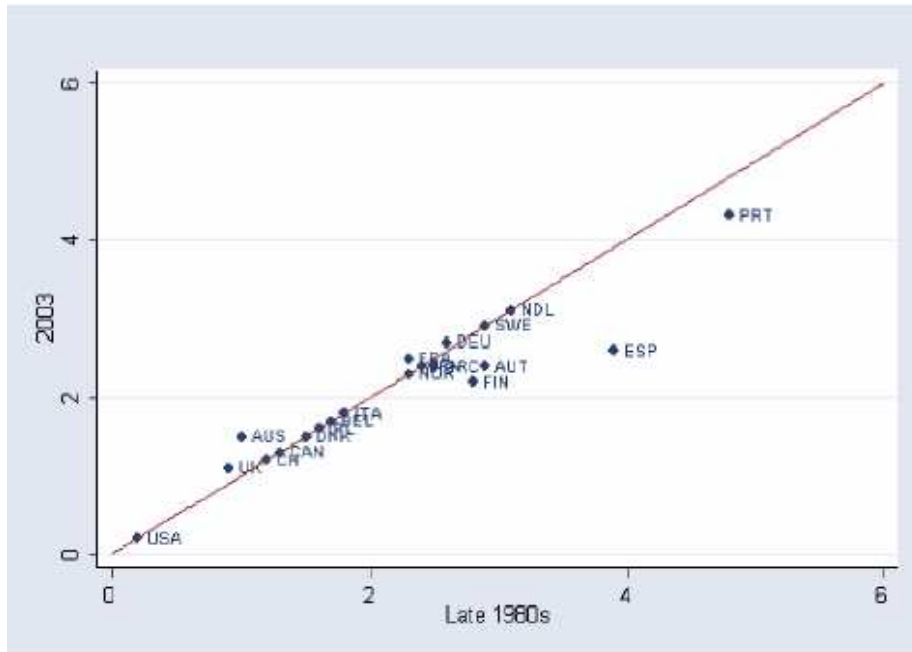


Figure 5 – Index of regulation of permanent contracts – Source: Eurostat

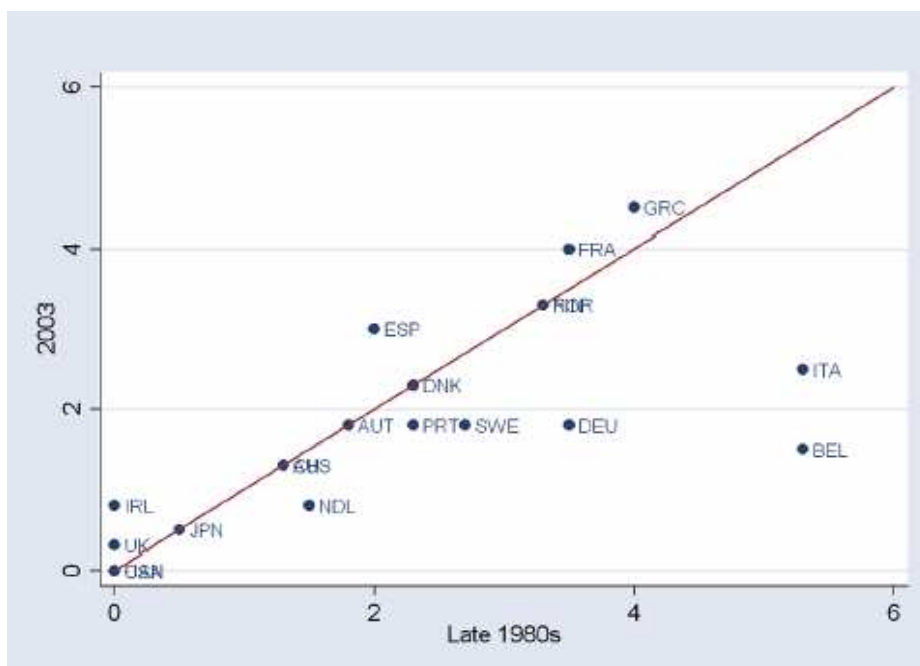


Figure 6 – Index of regulation of temporary contracts – Source: Eurostat

According to the model the results for one Country with a rigid regime R that introduces the temporary contracts F only for the new hiring, keeping untouched the roles for the workers hired pre-reform, should be:

- a short-term increase in employment (“Honeymoon Effect”);
- an increase in product less than proportional with respect to the increase in employment, due to a gradual decrease in labour productivity;
- a gradual realignment of the employment towards the pre-reform level.

Moreover, given that the “rigidity cost” m considered by the firms in the rigid regime R should have a higher weight for the young workers, for which there is not any information on their productivity and it is bigger the number of years that the firm expects to have to pay, another implication of the model is that in those Countries with an higher protection the rate of youthful unemployment should be significantly higher compared to the rate of middle-aged unemployment. This ample differential between the two worker brackets should be less marked in those Countries more flexible.

Finally, the model foresees a larger employment level in those Countries with the mixed regime M, characterized by permanent contracts without firing cost.

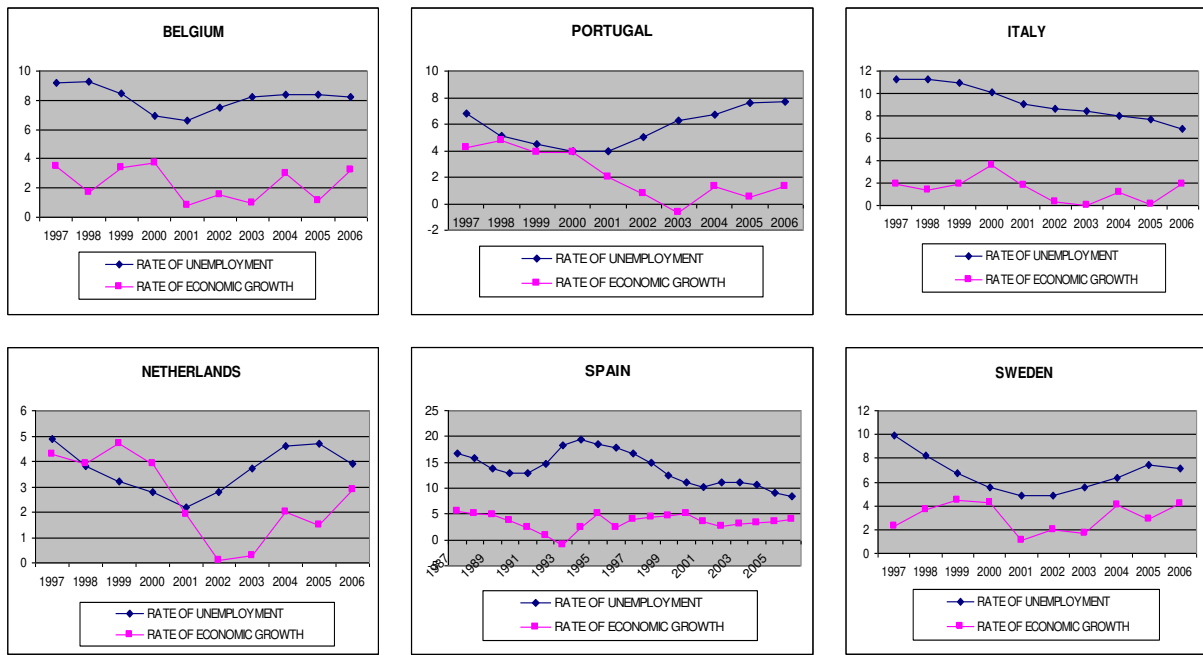
These results, even though among the several *caveat* needed in the empirical analysis, would seem to be supported by the empirical evidence²³.

From the figures 5 – 6 can be included rightly in the group of Countries that have introduced the fixed-term contracts from the rigid regime: Belgium, Italy, Netherlands, Portugal, Spain and Sweden. In the Figure 7 below there are the graphics of the rate of unemployment and the rate of economic growth of the aforesaid Countries.

European Countries. All these graphics (see Fig. 7), even though in their own peculiarities, show an important indication corresponding to the model expectations. In particular, in all European Countries immediately afterwards the liberalizations of the fixed-term contracts there was a decrease in unemployment and an increase in economic growth. After the first years there was a slackening in production, despite the employment was going on to increase. This piece of evidence points out that the average labour productivity has had a decrease. In the end, later more or less 4 years, there was a realignment of the rate of unemployment towards the pre-reform level.

Moreover, in Spain in the years following the 1997 reform, which reduced the protection for all workers, that is even for the workers pre-reform with permanent contracts, there was an increase in employment and in economic growth that in this case would seem to be structural and not only transitory, given that so far there was not any realignment towards the pre-reform level. Contrary to the theoretical expectations, the same thing was not in Portugal afterwards the 2001 reform, which had the same characteristics of the Spanish reform.

²³ The data on the employment and the growth of all Countries are Eurostat data. The graphical elaborations have been made with Microsoft Excel;



**Reforms years:
Belgium in 1997; Portugal in 1996-2001; Italy in 1997-2003;
Netherlands in 1999; Spain in 1985-1997; Sweden in 1997**

Figure 7 – Rate of unemployment and rate of economic growth of the European Countries

United States. In the United States, as it can be seen above, the regulation of the permanent contracts has the rigidity index lower than all European Countries, whereas there are not fixed-term contracts. Hence, the labour legislation in the United States provides for only the permanent workers although with the absolute freedom of dismissal, that is in terms of the model the mixed regime M. Therefore, according to the model the United States should have the employment level constantly higher than European Countries.

Down here it is showed the comparison between the rate of unemployment in the United States and an average of the rates of unemployment in the European Countries.

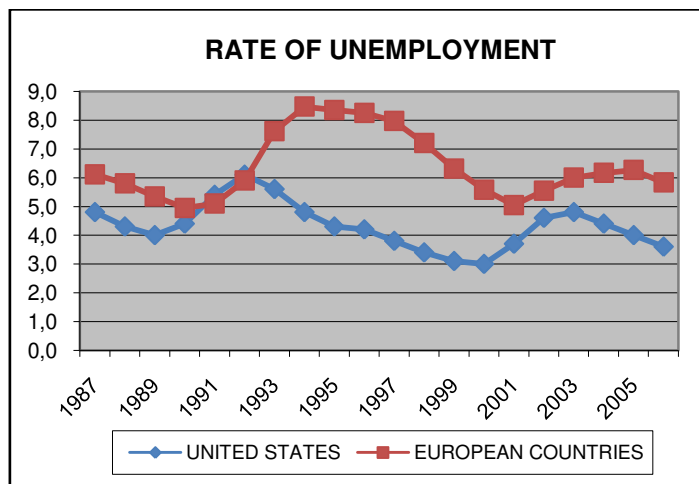
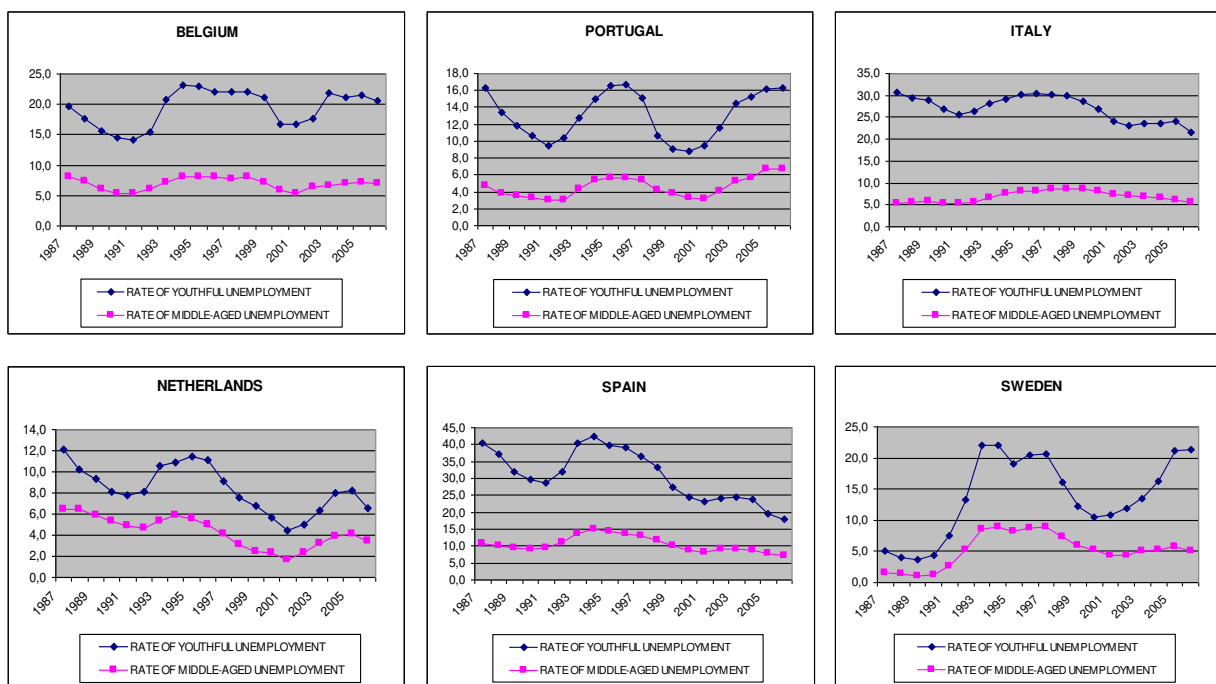


Figure 8 – Comparison between United States and Europe

Precisely as it was expected, the Figure 8 points out that the employment in the United States has been always higher than in Europe. Furthermore, as we can see, the distance between the two regions has been reduced in the last years, just later the decrease of the rigidity level of the labour institutional regimes in Europe. Even so, because of the inappropriate strategies used to reform the institutional regimes, as it has been maintained several times in this paper, the unemployment level in the United States remains beneath the unemployment level in the European Countries.

The differentiated effect of the reforms on the different worker brackets. Another implication of the model is that in those Countries, or in those periods in every Countries, characterized by a rigid regime, given that the “rigidity cost” m should be higher for the young workers respect to the middle-aged workers, the youthful unemployment should be significantly greater compared to the middle-aged unemployment. Furthermore, the introduction of an institutional regime more flexible should produce a gradual reduction of the gap between these two worker brackets.

Down here it is showed the graphic of the rates of unemployment for two different groups of workers (under 25 years and over 25 years):



**Reforms years:
Belgium in 1997; Portugal in 1996-2001; Italy in 1997-2003;
Netherlands in 1999; Spain in 1985-1997; Sweden in 1997**

Figure 9 – Rate of unemployment for two different worker brackets in the European Countries

These graphics (see Fig. 9) show that generally in those stages characterized by a protection regime extremely rigid the differential between the rate of youthful unemployment and the rate of middle-aged

unemployment is very large, whereas the same differential is reduced gradually just afterwards the introduction of the regimes more flexible.

Moreover, from these graphics it can be pointed out the unpleasant effect caused by the recent reforms, that is the creation of the dual labour market. Indeed, it is evident that the rate of youthful unemployment, hired with the fixed-term contracts, has a greater variability with respect to the rate of the middle-aged unemployment, hired before the reforms with the permanent contracts with all the guarantees pre-reform. This condition implies that all the greater flexibility on the hiring is borne only by the new workers. And this from the normative point of view it is surely not desirable.

Besides, the model expectations are supported by the comparison with the differential of the rates of unemployment of the two worker brackets in the United States, where the legislation is different with respect to the European legislation. In particular, the model foresees that in those Countries with a mixed regime M, not being the “rigidity cost” m given that the firms can always fire, the differential between the rate of youthful unemployment and the rate of middle-aged unemployment should be less marked.

Down here it is showed the graphic of the differential between the two worker brackets in the United States and in the European Countries:

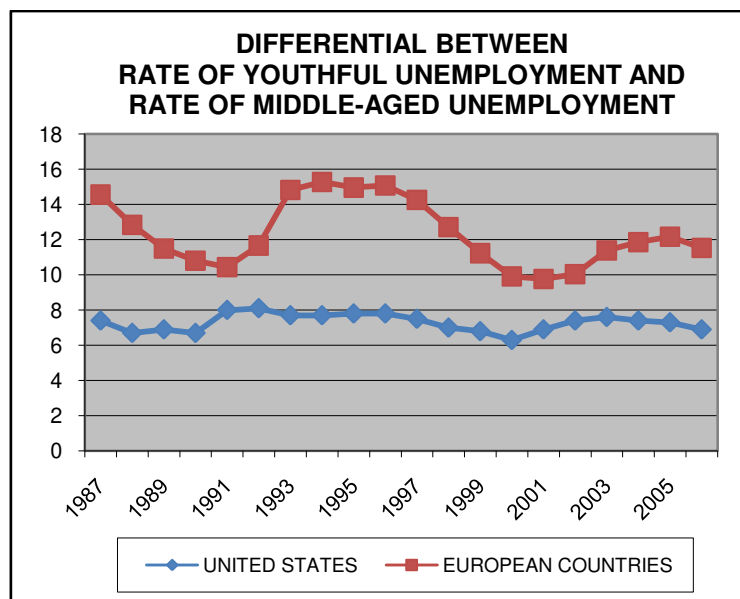


Figure 10 – Comparison between United States and Europe

From the analysis of the Figure 10 it is straightforward to observe that the differential in the United States has been constantly lower than in Europe. Furthermore, as it was expected, the difference between United States and European Countries even here is reduced in the last years, just afterwards the reduction of the rigidity of the regimes in Europe.

The general trends. From the empirical analysis of the employment and the economic growth in the main European Countries reforming the labour regimes, come out some common trends corresponding to the model expectations:

- the introduction of the fixed-term contracts produces a temporary increase in employment;
- the increase in product tends to be lower with respect to the increase in employment, presupposing a decrease in labour productivity;
- later about 3 – 4 years the employment begins to decrease towards the pre-reform level;
- after the introduction of the flexible reforms the differential between youthful unemployment and middle-aged unemployment, significantly large in those phases with strong rigidity, tends gradually to be reduced. However, the youthful unemployment has a very greater variability compared to the middle-aged unemployment, because all the greater flexibility in the hiring is borne by the new workers hired with the new contracts;
- there is not the next realignment of the employment towards the pre-reform level where the reform does not liberalize the fixed-term contracts, rather introduces the freedom of dismissal with permanent contracts.

In conclusion, besides the case of Portugal, the empirical evidence would seem to support the model expectations. Thus, the analysis and the empirical evidence lead us to maintain that the reforms of the institutional regimes liberalizing the fixed-term contracts exclusively for the new hiring do not produce a structural increase in employment, rather only transitory. Furthermore, owing the results of the model supported by the empirical analysis, an alternative more attractive would seem the regime with permanent contracts and freedom of dismissal, as the Spanish reform has introduced with appreciable outcomes and as has always been in the United States, where as we have seen the rate of unemployment has always been lower with respect to the European Countries. However, regardless to any value judgment on a labour regime that provides for the freedom of dismissal, it is undeniable the social cost that it is borne in terms of instability of the employee relationship and, consequently, of the economic system as a whole.

Therefore, an interesting proposal could be to identify a new institutional regime that can offer a positive solution both in terms of unemployment and in terms of stability of the employee relationship.

4. A proposal: the contractual benchmark regime

4.1 The characteristics of the institutional regime

What is come out from the previous paragraphs leads us to assert that the flexible regime does not consent to reach in the long run an employment level significantly superior with respect to the rigid regime. In particular, it has been appropriately highlighted that one of the most crucial point on the decisional process of worker is the opportunity to influence the firm choice on the renew of the contract through a greater effort, $p = f(e)$. It has been argued that this condition, owing the characteristics of the flexible regime, can be truth believably only for the skilled work and not for the unskilled work. The most important effect is the decrease in labour productivity and, consequently, the decrease in employment, which absorbs largely the original increase.

The analysis of the equilibrium that the flexible regime produces for the unskilled work has pointed out the worker chooses that effort level, and so that productivity level, also because of the impossibility to influence decisively the eventual renew of the contract. If for the unskilled worker this expectation is not believable, it is duty of the institutional regime to make like this. Indeed, the only way to made the expectation of the renew believable is to provide for the obligation of the renew for the firm. However, the obligation of the renew it is reasonable only when the worker is well productive. Otherwise it is would risked to reinsert in the decisional process of the firm on the labour stock that “rigidity cost” m that the flexible regime happily is able to eliminate²⁴.

From these premises it arises the contractual benchmark regime that consists of:

- permanent contract (at least for the first relationship between worker and firm) where the firm fixes contractually a level of performance (contractual benchmark) e^B and in case it is reached the worker has a right to renew the contract;
- the firm can choose to not renew the contract paying a compensation for loss of office to worker equal to a percentage β of the updated wage which the worker would have a right to.

Indeed, this regime does not differ greatly from the flexible regime; nevertheless, it has some peculiar characteristics, which are absent in the standard flexible regime, aiming to address the incentives to the parts worker/firm towards the right direction.

4.2 The analysis of the regime

The most important peculiarity of this regime is that the first contract is fixed-term, where the firm fixes contractually a level of performance of the worker. If the worker does his work as required he has a right to renew the contract. However, the firm could still choose to not renew the contract, paying a compensation to deserving worker. Thus, in this regime the firm does not consider the risk to have to keep a unproductive worker when decide the labour stock, given that it does not owe nothing to this kind of worker, as in the flexible regime. Furthermore, the firm has in any case the possibility to react to the demand and technological shocks, given that even for deserving workers it can choose to reduce the labour stock with a small cost. Finally, we can assume with much reasonability that in this regime the firm does not take into account the “rigidity cost” m , just as in the flexible regime.

The firm has the following profit function:

$$\pi_t = A_t \log L_t - w L_t$$

The first order conditions allow us to derive the employment level in this regime B:

²⁴ As it has been said, the cost m can be interpreted as the cost that the firm has to suffer to keep an unproductive worker. If the system provided for the obligation of renew of the contract for all workers, even for those unproductive, the firm would continue considering the cost m , losing the whole advantage of the flexibility;

$$\max_L \pi \rightarrow \frac{\partial \pi}{\partial L} = \frac{A^B}{L} - w = 0$$

$$\text{from which } \bar{L}^B = \frac{A^B}{w}$$

Fundamental it is to analyze how it is determined the labour productivity A^B . The worker hired, as always, chooses the effort level maximizing his utility function. Even in this case there is the time constraint and the threshold level constraint e^S under which the worker is fired. However, in this regime the worker has a credible expectation to can influence the renew of the contract through his own effort, that is $p = f(e)$. Or rather, in this regime the worker considers that if he reaches the level of performance contractually fixed e^B he has a right to renew the contract, or alternatively a compensation equal to a percentage β of the updated wage. Hence, the worker with this kind of contract has the following utility function:

$$U(l, e) = \begin{cases} f(w) + \log\left(\frac{l}{e}\right) + p f(w) \frac{1}{1+\delta} + (1-p) f(\beta w) \frac{1}{1+\delta}, & e \geq e^B \\ f(w) + \log\left(\frac{l}{e}\right), & e^S \leq e < e^B \\ \log\left(\frac{l}{e}\right), & e < e^S \end{cases}$$

where p = probability of the renew of the contract, $(1-p)$ = probability of the compensation and δ = rate of inter-temporal preference of the worker.

It is reasonable to expect for all workers that the utility level reachable if $e \geq e^B$ is significantly superior than the same available if $e^S \leq e < e^B$. So, for the worker it is rational to maximize the utility function subject to the constraint $e \geq e^B$:

$$\max_{(l,e)} U(w, l, e, p, \beta) = f(w) + \log\left(\frac{l}{e}\right) + p f(w) \frac{1}{1+\delta} + (1-p) f(\beta w) \frac{1}{1+\delta}$$

$$\text{s. v.: } \begin{cases} l + e = T \\ e \geq e^B \end{cases}$$

The Kuhn-Tucker conditions allow us to derive the effort level and, consequently, the productivity level in this regime B:

$$\bar{l}^B = (T - e^B) \quad \wedge \quad \bar{e}^B = e^B.$$

This result is confirmed by the graphical analysis of the decisional problem. As it is pointed out in the Figure 11, the possible choices of worker are in two plane divided by the effort level e . The first plane includes all choices for which $e \geq e^B$, whereas the second all choices for which $e^S \leq e < e^B$. Very important it is the shape of the indifferent curves. The curves start off the level e^S with the usual shape, as in the other regimes, but reached the level e^B they jump and start again off a level of l extremely inferior than the level of l needed to reach the same utility level in the plane $e^S \leq e < e^B$. This allow the worker to reach utility levels before unreachable. Therefore, the worker chooses the optimal effort level in correspondence with the lower indifferent curve which respects the time constraint and most of all the constraint $e \geq e^B$, that is the utility curve U^l and the point of coordinate $l^* = T - e^B$ $e^* = e^B$.

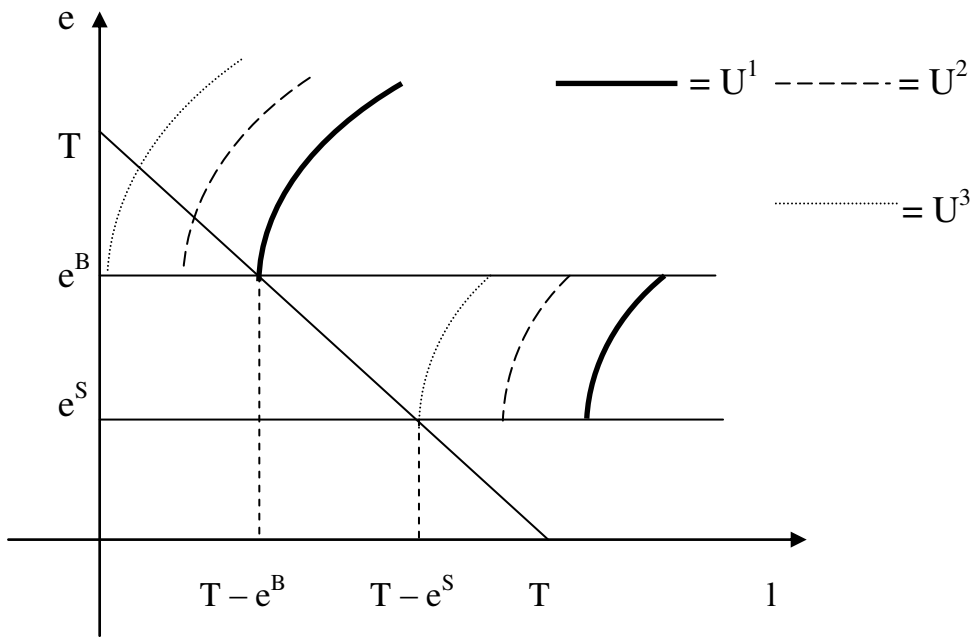


Figure 11 – Effort level of worker in the benchmark contractual regime

The level e^B is fixed by the firm in order to provide a positive profit μ . Therefore, the benchmark level e^B is the effort level that equalizes marginally this two values:

$$w + \mu = A(e) \log(L) - A(e) \log(L - 1)$$

from which:

$$\bar{e}^B = A^{-1}(e) \frac{w + \mu}{\log\left(\frac{L}{L-1}\right)}$$

The level μ that the firm want to make sure depends on the contractual power of the part worker/firm. It could be asked if the firm has not the incentive to fix always a level e^B too much high, or to avoid the achievement of it and, consequently, the renew of the contract, or to make sure a greater profit . Indeed, in this way the firm could run into an *adverse selection* problem, discouraging the more productive and willing workers to work in its firm, making its firm less competitive. So, for the firm would be better to fix a level e^B reachable, which stimulates the more productive workers to work in its firm.

Therefore, the labour productivity in the benchmark contractual regime B is:

$$\bar{A}^B = f(\bar{e}^B);$$

the employment is:

$$\bar{L}^B = \frac{\bar{A}^B}{w};$$

and the profit of the firm is:

$$\bar{\pi}^B = \bar{A}^B \log \bar{L}^B - w \bar{L}^B.$$

4.3 The comparison among the institutional regimes

After to have analyzed individually the new regime, now we are able to derive some important implications about what regime offers the best result in terms of employment:

- the labour productivity in the contractual benchmark regime B is surely greater respect to the rigid R and flexible F regimes, and greater equal to that one in the mixed regime M;
- the average employment in the benchmark contractual regime B is surely greater respect to the rigid R and flexible F regimes, and greater equal to that one in the mixed regime M;
- the variability of employment is greatest in the flexible F and mixed M regimes, medium in the benchmark contractual regime B and lowest in the rigid regime R;
- the profit of the firm in the benchmark contractual regime B is surely greater respect to the rigid R and flexible F regimes, and greater equal to that one in the mixed regime M.

For the labour productivity A , the analysis has pointed out that in the benchmark contractual regime B the workers are more productive:

$$\bar{e}^B > \bar{e}_R^S > \bar{e}_F^S \rightarrow \bar{A}^B = f(\bar{e}^B) > \bar{A}^R = f(\bar{e}_R^S) > \bar{A}^F = f(\bar{e}_F^S)$$

The comparison with the productivity level of the mixed regime M depends on the level μ . If μ was high, the productivity level would be greater in the benchmark contractual regime B. However, both because of the adverse selection problem already discussed above, and because of the competition among the firms, it can be foreseen a low level μ . Thus, we can wrap up that the productivity in the benchmark contractual regime B is greater equal to that one in the mixed regime M:

$$\bar{e}^B \geq \bar{e}_M^S \rightarrow \bar{A}^B = f(\bar{e}^B) \geq \bar{A}^M = f(\bar{e}_M^S)$$

For the employment L (see Fig. 12), the result of the analysis has pointed out that the long run employment produced by the benchmark contractual regime B is greater respect to the rigid R and flexible F regimes. In particular, the analysis has highlighted the effect of two factors both stimulating a greater labour demand: a greater labour productivity A which, producing an increase in revenues, leads the firms to demand more labour; the disappearance of the “rigidity cost” m (only respect to the rigid regime) which is a significant disincentive to hire. Therefore, even for the employment level the comparison award the benchmark contractual regime B:

$$\bar{L}^B = \frac{\bar{A}^B}{w} > \bar{L}^R = \frac{\bar{A}^R}{(w + m)} \cong \bar{L}^F = \frac{\bar{A}^F}{w}$$

Even in this case the comparison with the mixed regime M depends on the level μ . Assuming just as before a low level μ , we can wrap up that the employment in the benchmark contractual regime B is greater equal to that one in the mixed regime M:

$$\bar{L}^B = \frac{\bar{A}^B}{w} \geq \bar{L}^M = \frac{\bar{A}^M}{w}$$

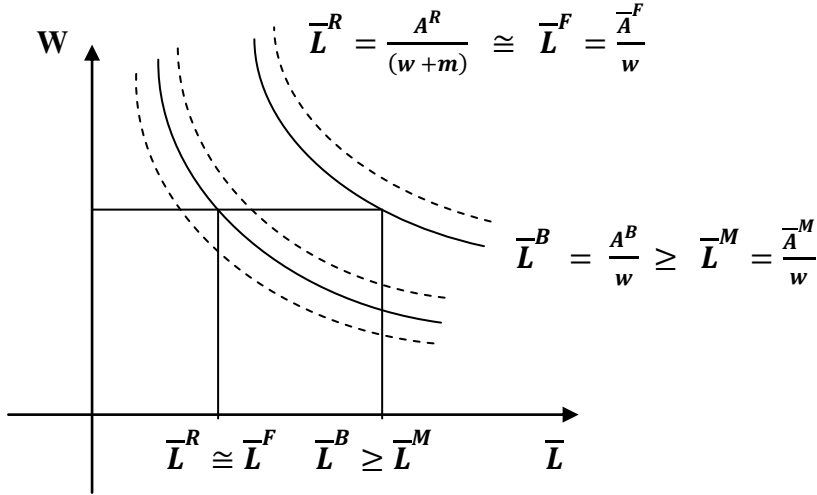


Figure 12 – Employment level in all regimes

Another important positive effect of this regime there would be on the variability of employment, that is the flows in and out the employment. In fact, on one hand it can be expected a greater flow in the employment respect to the rigid regime, and quite equal to the flexible and mixed regimes, thanks to the disappearance of the “rigidity cost” m , on the other hand it can be expected a lower flow out the employment respect to the flexible and mixed regimes, given that the obligation for the firms to renew the contracts to the more productive workers, whereas the flow out the employment concerns only the unproductive workers, for which rightly there is not the obligation to renew, and for which the coming out the employment seems more than justifiable and acceptable. This last result affects both the utility of being employed and the disutility of being unemployed. In particular, in the benchmark contractual regime B the utility of being employed is greater respect to the flexible F and mixed M regimes, owing the greater difficulty to come out the employment, or anyway owing the possibility to can influence through his effort the own persistency in employment, and the disutility of being unemployed is lower respect to the rigid regime R, owing the lower difficulty to find a work. Therefore, the benchmark contractual regime would seem in part to solve the *trade-off* between the utility of employment and the disutility of unemployment, which has been always one of the most dilemmas for the policy²⁵.

Finally, for the profit π the analysis has pointed out that the firms in the benchmark contractual regime B have a greater profit respect to those ones in the rigid R and flexible F regimes:

$$\bar{\pi}^B = \bar{A}^B \log \bar{L}^B - w \bar{L}^B > \bar{\pi}^R = \bar{A}^R \log \bar{L}^R - w \bar{L}^R \cong \bar{\pi}^F = \bar{A}^F \log \bar{L}^F - w \bar{L}^F$$

With regard to the mixed regime M, even in this case we can wrap up that the profit in the benchmark contractual regime B is greater equal to that one in the mixed regime M:

$$\bar{\pi}^B = \bar{A}^B \log \bar{L}^B - w \bar{L}^B \geq \bar{\pi}^M = \bar{A}^M \log \bar{L}^M - w \bar{L}^M$$

²⁵ In particular, in the rigid regime it is greater the utility of being employed but so is the disutility of being unemployed too, whereas in the flexible and mixed regimes the disutility of being unemployed is lower but so is the utility of being employed too. Hence, in this case the choice of the institutional regime is not univocal but it assumes a shape of a political choice. The benchmark contractual regime would seem to solve the choice problem;

In short, the results of the comparison are the following:

- the labour productivity A is greater in the benchmark contractual regime B;
- the employment level L , driven by the superior productivity, is greater in the benchmark contractual regime B;
- the profit of the firm, as well it driven by the superior productivity, is greater in the benchmark contractual regime B.

Indeed, the contribution given by the benchmark contractual regime respect to the other regimes is not reflected so much in terms of a greater structural employment, given that the employment level L produced does not move away significantly from that one produced by the mixed regime M. Rather, the significant contribution of the regime is the suitability to reach a greater employment level respect to the other regimes, preserving the gradual stability of the employee relationship, principle completely absent in a regime characterized by the full freedom of dismissal just as the mixed regime M.

Moreover, regardless of the desirability of a regime that provides for a gradual and meritocratic path towards the stability of the employee relationship from an ethic point of view, this principle without doubt benefits both the sustainability in terms of policy and the stability of the economic-financial system.

5. Conclusions

The recent economic literature on EPL has pointed out that a regime with a greater flexibility does not produce necessarily an increase in employment. These very important results have been elicited with models characterized by an exogenous labour productivity. In particular, the Boeri and Garibaldi model has showed the only temporary effect of the recent European reforms liberalizing the fixed-term contracts, which have produced a dual labour market.

In this paper it is developed a model of labour demand with endogenous labour productivity in order to study the effects of the different regimes on the employment. In particular, they are analyzed the decisional process of worker on effort and the incentives offered by the different regimes to workers and firms. The model, as the Boeri and Garibaldi model despite through another way, shows that the introduction of the flexible regime only for the new contracts produces a positive but only transitory effect on the employment level, due to the disappearance of the “rigidity cost” m and, consequently, to the larger willing of the firms to hire new workers; nevertheless, because of a decrease in labour productivity, in the long run the employment level comes back to the pre-reform level. The decrease in productivity is due to the inappropriate structure of incentives of the flexible regime.

In the course of the paper it has also been found that the model implications are supported by the empirical evidence. In particular, in all European Countries implementing a flexible reform, keeping unchanged the regulation of the pre-reform permanent contracts, there has been a temporary increase in employment not accompanied by a correspondent increase in product, because of a gradual decrease in

labour productivity. Later 3 – 4 years there has been a realignment of the employment towards the pre-reform level.

These results have a primary importance on the labour institutional organization and point out the necessity of an ulterior reforming intervention. In this paper, afterwards to have showed the inadequacy of the actual regimes, it is analyzed a new regime, called the benchmark contractual regime, not very dissimilar from the flexible regime but characterized by an adequate structure of incentives. The model shows that the introduction of this regime could produce a greater labour productivity and employment, non only in the short, but also in the long run.

Furthermore, considered the importance for the policymakers of the political proponability of every institutional reform, it has been noticed that the characteristics of the regime are correspondent to the needs of the social partners. From this point of view, the EPL literature could be an important contribution for the economic policy because it points out that it must be overtaken the ideological approach to the problems of the labour market, according which it would not exit a *first best* solution for the society as a whole, but the choice of the institutional regime would be a political choice on which part of the employee relationship prefer. The EPL literature, and in particular this paper, show that the right way is to search the structure of incentives that produces the better outcome for the society as a whole.

Without any presumption of being exhaustive, we maintain that the approach followed in this paper, that is the research of a new institutional regime different respect to the dichotomous alternative rigid-flexible, is deserving of attention. And this just cause we maintain that this paper is only a possible cue needed of ulterior improvements.

In conclusion, this paper shows that the propulsive effect of the flexible regime cannot represent a permanent solution to the unemployment and that a possible structural solution, which takes into account the needs of all social partners, could be the benchmark contractual regime.

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