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WHY IS THE EMPLOYMENT PROTECTION STRICTER IN EUROPE THAN IN THE US?

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Discussion paper

Why is the employment protection stricter in Europe than in the US?

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Abstract

In this paper, we argue that the reason why the United States prefer a lower level of employment protection than the European countries lies in the differences in gains and costs from geographical mobility. We present a model where labor migration and employment protection are both determined endogenously. The labor market is modeled within a matching framework, where the employment protection reduces both the job finding and firing rates. Countries with low migration costs and high economic heterogeneity may prefer no employment protection so that workers can move quickly to better horizons rather than being maintained in low productive activities.

Keywords: Geographic labor mobility, Employment protection, Search frictions, Voting

JEL classification: J61, J63, J64

1 Introduction

Employment protection is on average stricter in the US than in Europe. Long being blamed for the poor European labor market performance, together with other rigid labor market institutions, employment protection has recently, to some extent, been freed of charges. The role of the employment protection on the unemployment rate would be minor. However, employment protection has a significant negative effect on the labor market inflows and, in particular, unemployment in- and outflows (Nickell (1999) and OECD (1999)).

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Most of the European countries have been reforming their employment protection legislation (EPL) over the last decade, towards more flexibility essentially. Reforming these institutions might however be limited by the lack of political support. Saint-Paul (2000) has provided a major contribution with respect to the political economy of labor market institutions. He argues that these institutions benefit to a well-organized part of the population so that the implementation of a reform would be difficult. Rigid labor market institutions in Europe have given birth to large rents on the worker side, and the median voter is supposed to belong to that category.

While the consequences of the differences in institutions between the US and Europe are relatively well identified, their origins are more obscure. These countries are democracies and these institutions can be considered as the outcome of a democratic political process. The question is then: Why do the Europeans need employment protection while the Americans do not? Answering this question will help us to identify more clearly the role of employment protection and hopefully contribute to the large current debate on the reform of the EPL.

In this paper, we relate the differences in observed EPL to exogenous and fundamental differences in two dimensions: the economic heterogeneity and the migration costs. We argue that Americans desire a lower level of employment protection because the economic and cultural organization of the country provides a natural insurance against the risks of losing a job. European countries, on the other hand, are small, economically and culturally more homogenous when compared individually to the United States so that migration within countries makes less sense than it does in the United States. Furthermore, people do not migrate very much within their country even in the presence of inter-regional differentials. Reasons might be that other institutions (such as the regulation of the housing market or rigid labor market institutions) increase the moving costs. Euro-Land as a whole is, as we shall see in the empirical evidence, economically more heterogeneous than the United States.

The originality of our paper is that it links the efficiency of migration as an insurance device to the preferences of the workers with respect to employment protection. Besides other factors that we consider as exogenous here (such as the cultural and social barriers, the regulations of the housing market, the economic diversity of the country), employment protection also plays a crucial role in determining how efficient migration is as an insurance device. Employment protection typically reduces the job finding and firing rates so that workers remain maintained in low productive activities and cannot move quickly to the best productive places. When the other exogenous factors are such that migration could work well as an insurance device, we argue that the workers then prefer a low level of employment protection, so that job finding rates are high and they can move quickly to better horizons. When however there are important barriers to migration, the majority of the workers prefer their job to be safe and enjoying insider power. Hence, the relationship between employment turnover and employment protection should go in both directions and should be negative, as we observe in the empirical facts. Hassler and Rodriguez-Mora (1999) also suggest this type of relationship but then between employment turnover and unemployment insurance. Their argument however is different from ours. In particular, employment turnover determines how saving and borrowing are good substitutes for the unemployment insurance. Hence they show that a low turnover increase the persistence of income shocks and makes unemployment insurance relatively more attractive.

The paper is organized as follows. In section 2, we present some stylized facts and a brief review of the literature on employment protection and migration. In section 3, we introduce the model, and discuss the equilibria. In section 4, we conduct a numerical experiment to illustrate the mechanisms of the model. In section 5, we discuss our results and assumptions. Finally, we conclude in section 6.

2 Employment protection and migration - Evidence and theory

The employment protection legislation (EPL) is a set of rules that makes it harder for the firms to get rid of their workers. A survey of its recent evolution in OECD countries can be found in the OECD Employment Outlook (1999). Employment protection covers a series of legal arrangements regulating the ending of so-called open-end contracts and temporary arrangements. The OECD proposes an indicator summarizing the degree of strictness of employment protection. We re-organized the table by ranking all the countries according to their degree of strictness of EPL relative to open-end contracts (Table 1). On the top of the table (i.e. the most flexible countries), we find the Anglo-Saxon countries. Then come the Northern countries and continental European countries. Southern Europe is at the bottom of the table.

[Insert Table 1 here]

There is a huge literature on the effects of employment protection on labor market performance. There seems however to be a consensus on the following: Employment protection does not have much effect on the level of unemployment but does have an effect on the labor market flows and, in particular, on the unemployment in- and outflows (Nickell (1999), OECD (1999)). In other words, the empirical evidence suggests that it is easier for an unemployed person to find a job in a flexible country than in a rigid one (see for example Schettkat (1997)). This point is crucial for the argument of our paper. A population who does not support employment protection chooses high job finding and firing rates, which guarantee that workers can move quickly from low productive places to high productive ones. Employment protection reduces the gains from migration of unemployed looking for better jobs in other regions of the country.

This raises the question of why such rigidities exist in the first place. These countries are democracies and this type of institution is the outcome of a political process. Saint-Paul (1997) suggests that the reason why EPL is stricter in Europe than in the US relies on other existing rigidities, such as powerful union organizations. In this paper, we propose an alternative (but not rival) explanation relying on the difference in the gains and costs from migration. The United States are usually thought of as the country where people move fast and to a large extent. Europe on the other hand shows a lower degree of labor mobility, even within countries (see Thomas (1994), Decressin and Fatas (1995)).

Migration can be thought of as an insurance device against income fluctuations, in the absence of well-functioning financial markets. Employment protection legislation is a competing instrument to reduce the income variation associated with labor market shocks (such as an aggregate shock to productivity). Stark (1991) introduces migration as a risk-diversification device in the context of rural-urban migration in developing countries. However, when migration is not possible, i.e. when this insurance device is not available, one needs a substitute for it. Hence, income and job protection systems can be thought as alternative insurance devices when financial markets are absent and malfunctioning and when migration is too costly.

There is a lack of reliable statistical material on migration in different regions of different nation states of Europe. Puhani (2001) summarizes studies on labor mobility in OECD countries. These studies consider both migration between countries and within countries. What is usually observed is that migration as a share of the total population is lower in Europe than in the United States. The OECD (1986) shows that interregional migration is the highest in the USA, Australia and Canada and the lowest in Europe. A study by De Grauwe and Vanhaverbeke (1993) also shows that interregional mobility differs across European states. Hence, interregional mobility in the Southern countries (Spain, Italy) is less than half as large as in the Northern and continental ones (Denmark, Finland, France, the Netherlands and UK). These observations are very interesting for our purpose since this ordering corresponds precisely to the one we presented above, reporting the degrees of strictness of employment protection legislation. Hence, the empirical facts show that lower mobile countries have a stricter employment protection. However this is only an observed correlation, that does not tell anything about the direction of the causality. It could be that strong employment protection actually reduces labor mobility rather than the other way around. We will come back on this point later in this section.

Migration can work as a risk diversification device in the presence of economic heterogeneity. We should investigate two elements. First, labor mobility could be lower in Europe because there are less asymmetries, a larger economic homogeneity. Second, we should investigate whether the responses to these asymmetries are indeed lower in Europe than in the US.

Considering the first point, it is certainly true if one compares the United States with each European country in particular. The size of the United States is indeed such that the economic heterogeneity is larger than in any particular European country. This means that all else equal, migration would work less efficiently as an insurance device within European countries than within the United States.

Looking on the other hand at the economic heterogeneity of Euro-Land as a whole, the empirical evidence suggests the opposite. Hence, Bentivogli and Pagano (1999) note that asymmetric shocks are more likely to occur in Europe than in the US. This means that one should observe relatively more migration *between* European countries than *within* them, which is not supported by the empirical facts.

Concerning the second point, before claiming that migration does not work as an insurance device in Europe but does in the US, we should indeed check that the reason why people do not move in Europe is not linked to economic variables. In other words, we should observe that differentials in economic variables that could theoretically determine migration (such as unemployment differentials, wage differentials) do not stimulate migration. This would show that people do not use migration as a risk diversification device. Studies by Barro and Sala-i-Martin (1995) and Gros (1996) show that European migratory responses to unemployment and wage differentials between and within nation states are lower in Europe than in the United States. Barro and Sala-i-Martin (1995) estimate the elasticities of net migration into a region with respect to economic variables such as the per capita income in that region. They find a significant positive coefficient for the United States: A 10 percent differential in income per capita raises net-in-migration to bring the region's population growth rate up by 0.26 percent per year. This is apparently not such a strong effect but it is still stronger than the ones estimated for the European countries (where most of them are even insignificant). De Grauwe and Vanhaverbeke (1993) also show that interregional migration is relatively low in Southern European countries, despite the existence of higher income differentials in the South. In the same line of studies, Bentivogli and Pagano (1999) find that the response of wage and unemployment differentials is much stronger in the US than in the European regions taking part to the launching of the Euro-zone. They find that unemployment differentials stimulate population flows 10 times as much in the US than in Euro-Land and that wage differentials give rise to flows that are double the size in the US than in Euro-Land.

The question is then: why do people not migrate to better horizons? The obvious answer is that there are large social and cultural barriers. But this is not a very strong argument to explain low mobility within countries. Oswald (1996) and Gros (1996) mentions the role played by the regulation of the housing market. Gros observes in Europe a strong correlation between the rate of interregional migration and the proportion of houses occupied by their owners in 1991 and 1992. Oswald shows that differences in the "home ownerships" across OECD countries can explain part of the differences in observed unemployment rates. Another reason could be that European rigid labor market institutions make its workers relatively more attached to their roots. A recent paper by Hassler et al. (2001) argues that there is a circular relationship between the unemployment insurance system and the geographic attachment of the labor force (and so the low mobility). The more generous the unemployment system the more likely you are attached to your "region" and the more attached you are the stronger you support unemployment insurance. They find under certain conditions that two self-reinforcing equilibria can exist: one with low insurance, low mobility and high unemployment (typically the "European case") and the other one with high insurance, high mobility and low unemployment (typically the

”American case”). The reason why relatively unattached populations prefer a lower level of insurance lies in the existence of a fiscal distortion (unemployment benefits are financed by taxes raised on labor). In the same line of reasoning, we argue here that these institutions, and in particular employment protection, have been chosen *because of* the existence of moving costs related to more essential barriers such as the regulation of the housing market, the cultural and social barriers, etc. Once in place these institutions reduce even further the incentives to migrate but we think that they first should be thought as the consequence of a malfunctioning insurance device (migration).

3 The model

The objective of our paper is to show that the migration costs determine the preferences of the population with respect to employment protection. Employment protection plays two important roles for the workers. First, it protects their job and gives them some insider power (enables them to bargain higher wages). Second, it reduces both job creation and job destruction. This has two implications. It means first that it is more difficult for an unemployed worker to find a job and, second, that some low productive jobs are maintained although they would disappear if there was no employment protection.

Suppose the workers can choose between a fixed firing cost and no firing cost. One crucial aspect determining her choice is the exogenous migration gains and costs she has to incur when she wants to move to better horizons. Hence, if these gains are high (because for example of a large economic heterogeneity) and these costs are low (because for example of a larger cultural homogeneity), the median voter may be willing to trade the insider gains from employment protection for a better outside option. Indeed, without employment protection, job creation is high and it is relatively easy for an unemployed worker to find a job. If the firing cost is high on the other hand, this worker prefers her job to be safe even if this means it to be maintained at low productivity levels.

We now describe in detail the model.

3.1 Basic framework

We consider one country, that can be divided in two economic regions A and B. The level of employment protection is determined at the national level. Firms and workers form matches with a match-specific productivity x, that corresponds to a random draw from a uniform distribution $f(x)$ defined on the interval $[0, 1]$.

The productivity of the match also depends on the state of nature in which the region is. Let us denote by ε the stochastic regional shock. If a region is booming (state of the world g), all match-specific productivities are augmented by ε_g. This increment is independent of the initial draw x. This means that a booming region shifts the distribution of productivities by ε_g. If a region is on the other hand stagnating (state of the world b), all match productivities are simply the match-specific productivities x. The behavior of ε can be represented by a symmetric two-state Markov chain. $\varepsilon = \{0, \varepsilon_g\}$ and the stochastic transition matrix associated with it is:

$$\begin{pmatrix} (1-\lambda) & \lambda \\ \lambda & (1-\lambda) \end{pmatrix},$$

The parameters λ and ε_g represent in our framework the economic heterogeneity (or size of the country). The larger the country or the more diversified it is, the larger λ and ε_g.

A worker and a firm meet at a rate determined by a *matching function* $m(u, v)$, that exerts constant returns to scale. We define $\theta = \frac{v}{u}$ as the labor market tightness, i.e. the number of vacancies (v) available per unemployed worker (u being the total number of unemployed workers). The probability that an unemployed worker matches with a vacancy is then equal to $m(\theta) = \frac{m(u,v)}{u}$ and the probability that a vacancy matches with an unemployed worker is equal to $q(\theta) = \frac{m(u,v)}{v} = \frac{m(\theta)}{\theta}$.

Some matches do not lead to an employment relationship because their productivity is too low. We denote by $\underline{x}_b$ and $\underline{x}_g$ the productivity floors above which the worker and the firm find it profitable to establish an employment relationship. The productivity of a match remains constant over time, so that the only reason why the partners could separate is when the region is hit by an aggregate shock. Then low productive matches are destroyed and workers become unemployed. We denote by $\widetilde{x}$ the productivity threshold under which matches are destroyed once hit by an aggregate negative shock. Hence, in a boom, we can define two types of jobs: the *surviving* jobs (that will survive even if the region is hit by a negative productivity shock) and the *dying* jobs (that will not survive to the slump). In a slump, there are on the other hand only surviving jobs since the only shock that can happen would improve the productivity of the matches.

The regions are hit by perfectly negatively correlated aggregate shocks. This means that when region A is in a boom, region B is in a slump, and vice versa.

Each firm has one job slot that can be opened as a vacancy or filled by a worker. When the match the firm forms with the worker is hit by a sufficiently negative shock, the partners find it efficient to separate. The firm then incurs a firing cost c_f (that is a pure waste). The worker becomes unemployed after separation and looks for another job with a constant search intensity.

Unemployed workers can either search for a job in their own region or in the neighboring one. If they decide to look for a job in the neighboring region, they incur a fixed sunk cost c_m. This migration cost represents in this framework the set of regulations making it harder to leave your region (housing regulations) or cultural and social barriers.

The total unemployment in a region k, $k = g, b$ is then equal to the sum of the resident[1] unemployment $u_{k,k}$ and the "migrating" unemployment $u_{k,j}$ with $k \neq j$, and both ≥ 0.

$$u_k = u_{k,k} + u_{k,j}, \tag{1}$$

[1] A resident unemployed should be understood here as "currently searching on this particular labour market". A resident unemployed might in particular be a worker who originates from another region but was employed before in the region where she is searching for a job now.

3.2 Bellman equations

3.2.1 Values of being unemployed

The respective values of being unemployed in a good and bad regions are determined as follows:

$$rU_g = b + m(\theta_g)\,(E(W_g) - U_g) + \lambda \max[U_b, U_g - c_m], \tag{2}$$

$$rU_b = b + m(\theta_b)\,(E(W_b) - U_b) + \lambda \max[U_g, U_b - c_m], \tag{3}$$

where b is the unemployment benefit, $E(W_k)$ is the expected value of working in a region k, $k = g, b$. While being unemployed in the region k, a worker benefits from an unemployment income (that might as well be the value of leisure or other non-market activities); she finds a job with probability $m(\theta_k)$, for which the corresponding expected gain is equal to $E(W_k) - U_k$ and finally, she faces the risk λ of her region switching to the other state of the world. In the latter case, she might either stay in her region or migrate to the other region and incur the migration cost c_m. She migrates only if it is profitable to do so.

What are the main differences between the values of being unemployed in a bad and in a good region? First, the respective probabilities of finding a job may differ. It is easier to find a job in a tighter labor market. The tightness of the labor market is here determined both by migration decisions and vacancy posting. Second, once she finds a job, the expected value of this job may differ according to the state of the world. The intuition suggests that the expected value of working in a good region is higher than in a bad region. We show later that it is indeed the case.

3.2.2 Values of working

It is helpful for the analysis to distinguish between two types of jobs: *surviving* (s) and *dying* (d) jobs. Surviving jobs are those which survive negative productivity shocks. Dying jobs are those which do not. We observe simultaneously both types of jobs in a good region only. In a bad region there are typically surviving jobs only. We determine later the conditions under which a job is surviving or dying.

We define the value of working in a surviving job $W_g^s(x)$ in a good region as a function of the match-specific productivity x:

$$rW_g^s(x) = w_g^s(x) - \lambda(W_g^s(x) - W_b(x)), \tag{4}$$

where $w_g^s(x)$ is the corresponding wage and $W_b(x)$ is the value of working in a (surviving) job in a bad region.

The value of working in a *dying* job $W_g^d(x)$ in a good region is:

$$rW_g^d(x) = w_g^d(x) - \lambda(W_g^d(x) - \max[U_g - c_m, U_b]), \tag{5}$$

where $w_g^d(x)$ is the corresponding wage. A worker in a dying job loses by definition her job when the regional shock arises. Being unemployed, she has the choice to stay unemployed in the stagnating region or move to the booming neighboring region (and then incur the migration cost).

Finally, the value of working in a bad region is:

$$rW_b(x) = w_b(x) - \lambda(W_b(x) - W_g^s(x)), \tag{6}$$

where $w_b(x)$ is the corresponding wage.

3.2.3 Vacancy posting

Firms post vacancies on the labor market. The value of posting a vacancy V_k in a region k, $k = g, b$, is defined as follows:

$$rV_k = -c_r + q(\theta_k)(E(J_k) - V_k) + \lambda(V_j - V_k), \tag{7}$$

where c_r is the recruitment cost (or flow cost of posting a vacancy), $q(\theta_k)$ is the probability of matching with an unemployed worker, $E(J_k)$ is the expected value of filling a vacancy in region k and V_j is the value of posting a vacancy in region j, with $j \neq k$.

We assume that there is free entry on the vacancy market, so that firms post vacancies until the value of doing so is equal to 0:

$$rV_g = rV_b = 0. \tag{8}$$

This implies that vacancy posting is such that the expected cost of posting a vacancy is equal to its expected gain:

$$\frac{c_r}{q(\theta_k^*)} = E(J_k), \tag{9}$$

Condition [9] is usually referred to as the *job creation condition.* It implies here that the market tightness is the highest, in equilibrium, in the region that has the highest expected value of filling a vacancy (this means even after migration).

3.2.4 Values of filling a vacancy

We now turn to the equations determining the behavior of the firms. Again the distinction between the two types of jobs and regions is useful.

The respective values $J_g^s(x)$, $J_g^d(x)$ and $J_b(x)$ of filling a vacancy with a match with idiosyncratic productivity x are defined as follows:

$$rJ_g^s(x) = x + \varepsilon_g - w_g^s(x) - \lambda(J_g^s(x) - J_b(x)), \tag{10}$$

$$rJ_g^d(x) = x + \varepsilon_g - w_g^d(x) - \lambda(J_g^d(x) - V_b - (-c_f)), \tag{11}$$

$$rJ_b(x) = x - w_b(x) - \lambda(J_b(x) - J_g^s(x)), \tag{12}$$

where V_b is the value of posting a vacancy in a bad region.

The basic difference between the valuations of the jobs is that when filling a vacancy with a dying job, the firm knows that it will have to fire the worker with probability λ. The job then becomes vacant and the firm has to pay the firing cost c_f.

Let us now turn to the formal description of our model. Since we assume that the agents are perfectly farsighted, we solve the model by backward induction.

3.3 Wage bargaining

The worker and the firm bargain over the wages. We assume Nash-bargaining so that the wage maximizes a weighted average of the respective surplus of the bargaining partners:

$$w_g^s(x) = \arg\max_{w_g^s(x)} \left(W_g^s(x) - \overline{U}_g\right)^{\beta} \left(J_g^s(x) - V_g - (-c_f)\right)^{1-\beta}, \tag{13}$$

$$w_g^d(x) = \arg\max_{w_g^d(x)} (W_g^d(x) - \overline{U}_g)^{\beta} (J_g^d(x) - V_g - (-c_f))^{1-\beta}, \tag{14}$$

$$w_b(x) = \arg\max_{w_b(x)} \left(W_b(x) - \overline{U}_b\right)^{\beta} (J_b(x) - V_b - (-c_f))^{1-\beta}, \tag{15}$$

where β is the worker's relative bargaining power and $\overline{U}_k = \max[U_k^*, U_j^* - c_m]$, with $k \neq j$, defines the outside option of the worker: it is either being unemployed in the region where she is now or being unemployed in the other region but then incurring the migration cost in order to move there.

The equilibrium bargained wages are the following[2]:

$$w_{g,d}^s(x)^* = (1-\beta)(r\overline{U}_g^* + \lambda(\overline{U}_g^* - \overline{U}_b^*)) + \beta\left(x + \varepsilon_g + rc_f\right), \tag{16}$$

$$w_b(x)^* = (1-\beta)(r\overline{U}_b^* - \lambda(\overline{U}_g^* - \overline{U}_b^*)) + \beta\left(x + rc_f\right), \tag{17}$$

At a given match-specific productivity level x, the equilibrium wage is the same in a dying and in a surviving job. In both bad and good regions, the wage increases with the outside option $\overline{U}_k$, with the total productivity of the match and with two types of insider power coming from the firing cost and the difference between the two outside options. The first type is usually referred to as the *worker insider power,* i.e. the power of being already inside the firm. The second type is what we call here the *region insider power,* i.e. the power

[2] See Appendix 7.1 for formal derivations.

or weakness of being in the region. Suppose that workers in the good region are better off than workers in the bad region. If there is no migration cost, one should expect that the outside options in both regions should converge to each other. If there is a migration cost however, workers in a good region are better off because they do not suffer so much from the competition of migrant workers. Workers in a bad region, on the other hand, are "trapped" in their region. Therefore, this regional insider power pushes the wages up in a good region and down in the bad region (it is then more a weakness than a power).

Proposition 1 *Employment protection gives insider gains to the worker, by enabling her to bargain higher wages (since it deteriorates the outside option of the employer).*

Proof. Straightfoward. ■

3.4 Thresholds

In this section, we determine two types of match-specific productivity thresholds. First, the thresholds at which the firm is indifferent between offering a contract or not ($\underline{x}_b$ and $\underline{x}_g$) and second, the threshold at which the firm is indifferent between a surviving job and a dying job.

In order to determine these thresholds, we first need to calculate the equilibrium values of filling a vacancy, as a function of the match-specific productivity x[3]:

$$J_g^s(x) = (1-\beta)\left[\frac{x}{r} + \frac{(r+\lambda)\,\varepsilon_g}{r\,(r+2\lambda)} - \overline{U}_g\right] - \beta c_f, \tag{18}$$

$$J_b(x) = (1-\beta)\left[\frac{x}{r} + \frac{\lambda\varepsilon_g}{r\,(r+2\lambda)} - \overline{U}_b\right] - \beta c_f, \tag{19}$$

$$J_g^d(x) = (1-\beta)\left[\frac{x}{r+\lambda} + \frac{\varepsilon_g}{r+\lambda} - \frac{\left(\lambda(\overline{U}_g - \overline{U}_b) + r\overline{U}_g\right)}{r+\lambda}\right] - \frac{(r\beta+\lambda)}{r+\lambda}c_f, \tag{20}$$

[3]See Appendix 7.2 for formal derivations.

The value of filling a vacancy increases in all jobs with the match-specific productivity, the regional productivity increment and decreases with the outside option, the regional insider power and the firing cost.

Proposition 2 *Given* $\overline{U}_g^*$ *and* $\overline{U}_b^*$*, employment protection reduces the value of filling a vacancy, in all jobs and both regions.*

Proof. *Straightforward.* ■

Lemma 3 *The value of filling a vacancy with a dying job has a steeper slope than the value of filling a vacancy with a surviving job.*

Proof. $\frac{\partial J_g^s(x)^*}{\partial x} = \frac{1-\beta}{r} \leq \frac{1-\beta}{r+\lambda} = \frac{\partial J_g^d(x)^*}{\partial x}$, since $\lambda > 0$. ■

What is interesting for our purpose is that this effect is stronger for dying jobs than surviving ones. Indeed, employment protection then not only provides the workers with some insider power but represent an effective cost to be paid by the firm with probability λ.

Let us now turn to the determination of the productivity thresholds[4].

The lowest productivity level acceptable for the firm to employ the worker in a booming region denoted $\underline{x}_g$ is such that:

$$\underline{x}_g = Min[\underline{x}_g^d, \underline{x}_g^s], \tag{21}$$

where $\underline{x}_g^d$ is such that $J_g^d(\underline{x}_g^d) = 0$, $\underline{x}_g^s$ is such that $J_g^s(\underline{x}_g^s) = 0$. In words, the minimum level of productivity required to start an employment relationship in a booming region is the productivity level such that the corresponding value of matching for the firm is equal to 0. When $\underline{x}_g^d < \underline{x}_g^s$, dying jobs exist and the lowest productive job is dying. When $\underline{x}_g^d \geq \underline{x}_g^s$, dying jobs do not exist and the lowest productive job is surviving.

$\underline{x}_g^s$ is such that:

$$\underline{x}_g^s = -\frac{r+\lambda}{r+2\lambda}\varepsilon_g + r\overline{U}_g^* + \frac{r\beta}{1-\beta}c_f, \tag{22}$$

[4] See Appendix 7.3 for formal derivations.

$\underline{x}_g^d$ is such that:

$$\underline{x}_g^d = -\varepsilon_g + \lambda(\overline{U}_g^* - \overline{U}_b^*) + r\overline{U}_g^* + \frac{r\beta + \lambda}{1-\beta} c_f, \tag{23}$$

The lowest match-specific productivity level acceptable for a firm to start an employment relationship in a stagnating region, denoted $\underline{x}_b$, is such that $J_b(\underline{x}_b) = 0:$

$$\underline{x}_b = -\frac{\lambda}{r + 2\lambda}\varepsilon_g + r\overline{U}_b^* + \frac{r\beta}{1-\beta} c_f, \tag{24}$$

Expressions [22], [23] and [24] establish a positive relationship between the outside option in one region (U_k) and the minimum productivity required at entry. This is the second step in job creation (after vacancy posting, that we analyze in the next section). The higher the outside option, the higher the productivity required at entry. This relationship depends on other parameters. We summarize their influences in the three next propositions.

Proposition 4 *Given $\overline{U}_g^*$ and $\overline{U}_b^*$, employment protection pushes the productivity required at entry up, in all jobs and both regions.*

Proposition 5 *Given $\overline{U}_g^*$ and $\overline{U}_b^*$, economic heterogeneity decreases the productivity required at entry, in all jobs and both regions.*

Proposition 6 *Given $\overline{U}_g^*$, the good-region insider power increases the productivity required at entry, in dying jobs.*

Proof. Straightforward. ■

Hence, the economic heterogeneity stimulates job creation while the good-region insider power reduces it.

The threshold between a dying and surviving job $\widetilde{x}$ is defined as follows:

$$\widetilde{x} = \min\{\underline{x}_g^s, \widetilde{x}_{d,s}\}, \tag{25}$$

where $\widetilde{x}_{d,s}$ is such that:

$$J_g^d(\widetilde{x}_{d,s}) = J_g^s(\widetilde{x}_{d,s}), \tag{26}$$

which leads to the following expression for $\widetilde{x}_{d,s}$:

$$\widetilde{x}_{d,s} = -\frac{\lambda}{r+2\lambda}\varepsilon_g + \frac{r\overline{U}_b^*}{r+\lambda} - rc_f \tag{27}$$

Equation [27] determines the productivity limit for job destruction. Under this productivity limit, jobs are destroyed once the region falls into slump: these jobs are dying jobs. The higher the outside option $\overline{U}_b^*$ the more likely a job will be destroyed. Furthermore[5], the outside option $\overline{U}_b^*$ is an increasing function of θ_g and θ_b. The intuition is simple: the tighter the market, the easier it is for unemployed to find a job and so the higher the value of being unemployed. Hence equation [27] can be interpreted as the *job destruction* condition.

Proposition 7 *Given θ_b, θ_g and $\underline{x}_g$ employment protection has an ambiguous effect on job destruction.*

Proof. The firing cost has a direct negative effect on $\widetilde{x}_{d,s}$ but it has a positive effect on $\overline{U}_b^*$ by providing some future insider gains. $\frac{\partial \widetilde{x}_{d,s}}{\partial c_f} = -r + \frac{r}{(r+\lambda)(r+2\lambda)}\frac{\beta}{1-\beta}(\lambda m(\theta_g)(1-F(\underline{x}_g)) + (r+\lambda)m(\theta_b)(1-F(\underline{x}_b))$. ∎

Proposition 8 *Given θ_b, θ_g and $\underline{x}_g$ economic heterogeneity reduces job destruction, i.e.* $\frac{\partial \widetilde{x}_{d,s}}{\partial \varepsilon_g} < 0$.

Note that economic heterogeneity increases the share of dying jobs, since its negative effect on $\underline{x}_g$ is larger than on $\widetilde{x}$. Furthermore, we have shown that the value of filling a vacancy with a *dying* job is more sensitive to changes in the employment protection than the value of filling a vacancy with a *surviving* job. We will see when determining the political equilibrium that this effect is important to distinguish the preferences of "economically homogenous" countries from the ones of "economically heterogeneous" ones.

Lemma 9 $J_g^s(x)^* \geq (\leq) J_b(x)^* \Longleftrightarrow \frac{\varepsilon_g}{r+2\lambda} \geq (\leq) \overline{U}_g^* - \overline{U}_b^*$

Lemma 10 $J_g^s(x)^* \geq (\leq) J_b(x)^* \Longleftrightarrow \underline{x}_b \geq (\leq) \underline{x}_g^s$

Lemma 11 *Dying jobs require $\underline{x}_g^s \geq \underline{x}_g^d$.*

[5] See Appendix 7.1.

3.5 Vacancy posting

Let us now come back on the vacancy posting decision. We assumed that there is free entry on the vacancy market, such that vacancies are posted in region k until $V_k = 0$. Let us recall the job creation condition:

$$\frac{c_r}{q(\theta_k)} = E(J_k), \tag{28}$$

where

$$\begin{aligned} E(J_g) &= \int_{\underline{x}_g^s}^{1} J_g^s(x)dx, \text{ if } \underline{x}_g = \underline{x}_g^s, & (29) \\ &= \int_{\underline{x}_g^d}^{\widetilde{x}} J_g^d(x)dx + \int_{\widetilde{x}}^{1} J_g^s(x)dx, \text{ if } \underline{x}_g = \underline{x}_g^d, & (30) \\ E(J_b) &= \int_{\underline{x}_b}^{1} J_b(x)dx, & (31) \end{aligned}$$

Equation [28] establishes a negative relationship between the outside option U_k and the market tightness θ. The outside option pushes the wages up and the values of filling a vacancy down, and so reduce the profitability of posting a vacancy. This equilibrium condition is the first step in job creation. Hence, the outside option reduces job creation through two channels: first, by reducing the profitability of vacancy posting and, second, by increasing the productivity required at entry.

Proposition 12 *The market is tighter in the good (bad) region if the value of filling a vacancy with a surviving job in a good region is higher (lower) than the value of filling a vacancy in a bad region:* $J_g^s(x)^* \geq (\leq) J_b(x)^* \Longleftrightarrow \theta_g^* \geq (\leq) \theta_b^*$

Proof. *See Appendix 7.4.* ■

Hence if offering a surviving job in a good region is relatively more profitable than in a bad region, independently of the match-specific productivity x, more vacancies are posted there and the market is tighter in the good region than in the bad region. The reverse is also true.

Proposition 13 *Given* $\overline{U}_b$ *and* $\overline{U}_g$*, an increase in the employment protection has a negative effect on vacancy posting.*

Proof. Using Leibniz rule:

In a good region (with dying jobs):

$\frac{c_r}{q(\theta_g)^2}\frac{\partial q(\theta_g)}{\partial\theta_g}\frac{\partial\theta_g}{\partial c_f}=\left[-\frac{r\beta+\lambda}{r+\lambda}(F(\widetilde{x})-F(\underline{x}_g^d))-\beta(1-F(\widetilde{x}))\right]<0;$

In a bad region:

$\frac{c_r}{q(\theta_b)^2}\frac{\partial q(\theta_b)}{\partial\theta_b}\frac{\partial\theta_b}{\partial c_f}=[-(1-F(\underline{x}_b)\beta]<0.$ ◾

Proposition 14 *The larger the economic heterogeneity the larger the negative effect of employment protection on vacancy posting. Furthermore, the lower the good-region insider power, the larger the negative effect of employment protection on the number of vacancies posted in the good region.*

Proof. *See Appendix 7.5.* ◾

The intuition goes as follows. In both regions, the economic heterogeneity increases the share of matches leading to an employment relationship.That is a "volume effect".

There is an additional effect in a good region: The economic heterogeneity increases the share of dying jobs. Since dying jobs are the jobs for which the corresponding values of filling a vacancy are the most sensitive to employment protection, a larger economic heterogeneity makes the employers even more vulnerable to changes in the employment protection.

The good-region insider power, on the other hand, has the opposite effect.

3.6 Migration decision

Let us now turn to the migration decision. All workers can migrate but in equilibrium only unemployed workers find it profitable to do so. The reason is that when bargaining over wages, workers take their migration opportunities into account in determining their outside option. In our framework, migration implies becoming unemployed in the other region and look for a job over there.

Before migration takes place, the labor market in a region k is composed of v_k vacancies and $u_{k,k}$ resident unemployed. We define $[U_g^*]^z$ and $[U_b^*]^z$ the equilibrium values of being unemployed if no migration would take place (the subscript z stands for "zero migration"). The respective market tightnesses are then $[\theta_g^*]^z = \frac{v_g^*}{u_{g,g}^*}$ and $[\theta_b^*]^z = \frac{v_b}{u_{b,b}}$.

Let us now consider the migration decision. An unemployed worker in a region k, with $k = b, g$, migrates to the neighboring region when the value of being unemployed there $[U_j^*]^z$, with $j \neq k$ minus the migration cost c_m is larger or equal to the value of being unemployed in her own region:

$$[U_j^*]^z - c_m \geq [U_k^*]^z, \tag{32}$$

Condition [32] is identical for all unemployed workers, since they are homogenous.

In equilibrium, migration occurs only in one direction. We show later in this section that migration occurs from the bad region to the good region.

The larger the difference between the values of the unemployed before migration and the smaller the cost of migration the larger the migration flow. The pool of unemployed in the good region is now equal to $u_g = u_{g,g} + u_{b,g}$ and in the bad region is on the other hand $u_b = u_{b,b} - u_{b,g}$ where $u_{k,j}$ is the number of unemployed people migrating from region k to region j.

Let us summarize the *migration condition*:

$$\begin{aligned} if\ [U_j^*]^z - c_m &\geq [U_k^*]^z \Leftrightarrow u_{k,j} \geq 0 \text{ such that } [U_j^*]^m = [U_k^*]^m + c_m, \\ else\ u_{k,j} &= 0, \end{aligned} \tag{33}$$

where $[U_j^*]^m$ is the equilibrium value of being unemployed in a region j (after migration).

We see that once condition [32] is met, unemployed workers are better off in a good region than in a bad region. And the larger the migration cost the better off they are. Why is that? The reason is that unemployed workers in a good region benefit from a *region insider power*, i.e. from the advantage of being already in the good region. If there is no migration cost unemployed workers from the bad region migrate until there is no difference anymore between the values of being unemployed in either region. If migration is too costly for any worker, the market is necessarily less tight in a good region than it would have been with costless migration. Unemployed workers in a good region do not suffer from the same competition because of this positive migration cost. This explains why they are relatively better off than their counterparts in the bad region.

Let us note however that an infinite cost of migration does not mean that the workers in a good region are infinitely better off than in the bad region. What happens then is that the labor markets in both regions are completely separated and the difference between the values of being unemployed in either region is as large as it could be. As soon as the migration cost does give some incentives to migration the values of being unemployed adjust and converge towards each other. Hence regional differences are attenuated as soon as some migration is profitable.

The equilibrium values of being unemployed are on the other hand[6]:

$$U_g^* = \frac{1}{(r+2\lambda)} \begin{array}{l} (r+\lambda)\left[b+\left(\frac{\beta}{1-\beta}\left(c\theta_g^* + c_f m(\theta_g^*)(1-F(\underline{x}_g^*))\right)\right)\right] \\ +\lambda\left[b+\left(\frac{\beta}{1-\beta}\left(c\theta_b^* + c_f m(\theta_b^*)(1-F(\underline{x}_b^*))\right)\right)\right], \end{array} \quad (34)$$

$$U_b^* = \frac{1}{(r+2\lambda)} \begin{array}{l} (r+\lambda)\left[b+\left(\frac{\beta}{1-\beta}\left(c\theta_b^* + c_f m(\theta_b^*)(1-F(\underline{x}_b^*))\right)\right)\right] \\ +\lambda\left[b+\left(\frac{\beta}{1-\beta}\left(c\theta_g^* + c_f m(\theta_g^*)(1-F(\underline{x}_g^*))\right)\right)\right], \end{array} \quad (35)$$

Lemma 15 *$\theta_g^* \geq (\leq)\theta_b^*$ and $\underline{x}_g \leq (\geq)\underline{x}_b \Rightarrow U_g^* \geq (\leq) U_b^*$.*

Proof. Straightforward. ■

Proposition 16 *In equilibrium, migration occurs only from the bad to the good region.*

Proof. Let us assume it is not true, i.e. that migration occurs from the good region to the bad region. This requires $[U_g^*]^z \leq [U_b^*]^z$. A necessary condition is $\theta_g^* \leq \theta_b^*$ and $\underline{x}_g \geq \underline{x}_b \Longleftrightarrow J_b(x) \geq J_g(x), \forall x \Longleftrightarrow \frac{\varepsilon_g}{r+2\lambda} \leq [U_g^*]^z - [U_b^*]^z \Longleftrightarrow \frac{\varepsilon_g}{r+2\lambda} \leq 0$, which is not possible by assumption ($\varepsilon_g > 0$). ■

[6] See Appendix 7.1 for formal derivations.

Proposition 17 *There are two migration equilibria: a zero-migration (ZM) equilibrium where no one migrates and a full-migration (FM) equilibrium where all the unemployed workers in the bad region migrate to the good region.*

Proof. *If it is too costly for one unemployed worker to migrate, it is too costly for all of them since they are homogenous. Hence, we do have a ZM equilibrium. When, on the other hand, migration is profitable for one worker, it will be profitable for all of them to migrate. The reason lies in the vacancy posting decision. Indeed, a tighter labor market means that it is more attractive for the unemployed workers to migrate over there. But each migrant stimulates again vacancy posting in the region where she is migrating by reducing the market tightness. And, similarly, each migrant leaving her region discourages vacancy posting in her originating region by making the market less tight there. Hence, there is full migration of all unemployed workers in the bad region and vacancies are posted in the good region only.* ∎

Consequently, the outside options of the worker can be written as:

In the ZM equilibrium:

$$[\underline{U}_g^*]^z = [U_g^*]^z, \tag{36}$$

$$[\underline{U}_b^*]^z = [U_b^*]^z, \tag{37}$$

and in the FM equilibrium:

$$[\underline{U}_g^*]^f = [U_g^*]^f, \tag{38}$$

$$[\underline{U}_b^*]^f = [U_g^*]^f - c_m, \tag{39}$$

Furthermore, the difference between the outside options, i.e. the regional insider power is defined as:

$$[\underline{U}_g^*]^z - [\underline{U}_b^*]^z = [U_g^*]^z - [U_b^*]^z, \tag{40}$$

$$[\underline{U}_g^*]^f - [\underline{U}_b^*]^f = c_m, \tag{41}$$

Combining with the migration condition [33], we find that:

$$\Delta\underline{U}^* = \underline{U}_g^* - \underline{U}_b^* = \min[c_m, [U_g^*]^z - [U_b^*]^z], \tag{42}$$

which is an monotonically increasing function of c_m. Hence, the regional insider power increases with the migration cost. When the migration cost is so large that it there is no migration taking place, the difference between the outside options in a good and bad regions is "as large as it could be".

Proposition 18 *Ceteris paribus, if two countries end up in different equilibria, it must be that country in the ZM equilibrium is characterized by a higher migration cost than the country in the FM equilibrium.*

Hence, a high migration cost makes it more likely that the country will be in a zero migration equilibrium. In that case, migration as an insurance device is not an option.

The differential in the values of being unemployed in each region determines whether migration is attractive or not. Our argument is that economic homogeneity and employment protection reduce this differential and, therefore, the attractiveness of migration. Our numerical experiment illustrates the argument.

3.7 Equilibrium

We can now fully characterize the steady-state equilibria.

3.7.1 Unemployment rates

The steady-state unemployment rate is such that the flows into unemployment exactly compensate for the outflows. This equilibrium condition has different implications in the full and zero migration equilibria.

Full migration equilibrium In the FM equilibrium, all workers becoming unemployed when a region falls into a slump migrate to the booming region to search for a job. Hence the unemployment in the stagnating region u_b is such that:

$$u_b = u_{b,b} - u_{b,g}, \tag{43}$$

$$u_{b,g}^* = u_{b,b}^*, \tag{44}$$

which implies that:

$$u_b^* = 0, \tag{45}$$

The unemployment in the booming region is on the other hand such that:

$$\begin{aligned} u_g^* &= u_{g,g}^* + u_{b,g}^* && (46) \\ &= u_{g,g}^* + u_{b,b}^* && (47) \end{aligned}$$

We normalize the total labor force to 1:

$$u_b + u_g + e_b + e_g = 1, \tag{48}$$

where e_g and e_b are the employment levels (or rates) in a booming and stagnating regions respectively.

In a full migration equilibrium the two regional labor markets are unified into one national labor market. The steady-state condition for unemployment is then:

$$m(\theta_g^*)(1 - F(\underline{x}_g^*))u_g^* = e_g^* \frac{F(\widetilde{x}^*) - F(\underline{x}_g^*)}{1 - F(\underline{x}_g^*)} \lambda, \tag{49}$$

On the LHS we find the flow out of unemployment. Remember that all unemployed workers find it profitable to search for a job in the booming region and that for that reason, vacancies are posted in that region only. The only way for an unemployed to escape unemployment in that equilibrium is to find a job in the booming region. On the RHS we find the flows into unemployment. Workers become unemployed if they were employed in the booming region, that the region falls into a slump (this happens with probability λ) and if they were in a dying job.

Finally, the equilibrium employment rates are linked to each other in the following way.

$$\begin{aligned} e_b^* &= e_g^* \left(1 - \frac{F(\widetilde{x}^*) - F(\underline{x}_g^*)}{1 - F(\underline{x}_g^*)} \lambda \right), && (50) \\ e_g^* &= e_b^* + m(\theta_g^*) u_g^*, && (51) \end{aligned}$$

Note that condition [49] is a linear combination of conditions [50] and [51].

Zero migration equilibrium The ZM equilibrium is such that the labor market can be divided into two separate labor markets. Formally we have:

$$u^*_{b,g} = 0, \tag{52}$$

which implies that:

$$\begin{aligned} u^*_b &= u^*_{b,b}, & (53) \\ u^*_g &= u^*_{g,g}, & (54) \end{aligned}$$

The steady-state is such that the unemployment rate in a stagnating region and in a booming region are constant over time. Of course this means that in each region the unemployment rate varies from "high" to "low" levels, depending on the state in which they are. We assume for simplicity that both regions are of equal size:

$$e^*_g + u^*_{g,g} = e^*_b + u^*_{b,b} = \frac{1}{2}, \tag{55}$$

The equilibrium flow condition on the other hand becomes now:

$$m(\theta^*_g)(1 - F(\underline{x}^*_g))u^*_g + m(\theta^*_b)(1 - F(\underline{x}^*_b))u^*_b = e^*_g \frac{F(\widetilde{x}^*) - F(\underline{x}^*_g)}{1 - F(\underline{x}^*_g)}\lambda, \tag{56}$$

where the basic difference with the full migration equilibrium lies in the existence of a flow out of unemployment in the stagnating region. Finally, the two equilibrium employment rates are linked in the following way:

$$\begin{aligned} e^*_b &= e^*_g \left(1 - \frac{F(\widetilde{x}^*) - F(\underline{x}^*_g)}{1 - F(\underline{x}^*_g)}\lambda\right) + m(\theta^*_b)u^*_b & (57) \\ e^*_g &= e^*_b + m(\theta^*_g)u^*_g & (58) \end{aligned}$$

3.8 Voting for employment protection

Let us now turn to the political economy of employment protection. The argument of our paper is that the preferences with respect to employment protection depend crucially on the efficiency of migration as an insurance device. In particular, we are interested in the roles played by the economic diversity and the migration costs.

First, the economic heterogeneity and the migration cost determine in which equilibrium the economy will be. The role of the migration cost is clear. Economic heterogeneity increases the difference between the employment thresholds $(\underline{x}_b - \underline{x}_g)$ and so implies larger differences in job creation, and hence in values of being unemployed in one region compared to the other. Hence, economic heterogeneity increases the migration gains. Hence, more homogenous economies or economies with high migration costs are more likely to end up in the ZM equilibrium.

Second, a high economic heterogeneity and low migration costs magnify the effects of employment protection on the market tightness and on the outside option of the workers. To see this, we plot in Graph 1.0 the job creation and job destruction conditions in a two-dimensions graph (U_g, θ_g). Let us consider the FM equilibrium. Then $U_b^* = U_g^* - c_m$ so that we can express the job destruction condition as a function of U_g and θ_g. Job creation (JC) is upward-sloping and job destruction (JD) is downward-sloping. An increase in the firing cost shifts the JC curve to the left: The number of vacancies posted decreases at each level of the outside option U_g. The effect on the JD curve is ambiguous. If the insider gains are small, the JD curve shifts to the left also. At each level of market tightness, the threshold under which job destruction occurs falls which means that the corresponding outside option goes up. If the insider gains are larger, the JD curve shifts to the right. What is particularly interesting for our purpose is that the shift of the JC curve is larger when the economic heterogeneity is high and the migration costs are low.

Hence, in conclusion, the outside option is much more likely to be deteriorated and the market tightness to fall when the economic heterogeneity is high and the migration costs are low.

3.8.1 The tools

The values of working and the values of being unemployed determine the preferences of the workers. We are especially interested in comparing the roles of migration and employment protection on these preferences.

Let us first look at the equilibrium values of being unemployed[7].

$$[U_g^*]^f = \frac{b + \left(\frac{\beta}{1-\beta}(c\theta_g + m(\theta_g)(1 - F(\underline{x}_g))c_f\right) - \lambda c_m}{r}, \tag{59}$$

$$[U_g^*]^z = \frac{b + \left(\frac{\beta}{1-\beta}(c\theta_g + m(\theta_g)(1 - F(\underline{x}_g))c_f\right) - \lambda(([U_g^*]^z - [U_b^*]^z))}{r}, \tag{60}$$

In both equilibria, unemployed workers face a trade-off between a job finding rate (with presumably low employment protection) and future insider gains. We expect that the larger the economic heterogeneity and the smaller the migration costs, the more likely unemployed prefer high job finding rates to insider gains.

Let us know look at the values of being unemployed in a bad region:

$$[U_b^*]^f = U_g^* - c_m \tag{61}$$

$$= \frac{b + m(\theta_g)\left(\frac{\beta}{1-\beta}(c\theta_g + (1 - F(\underline{x}_g))c_f\right) - (r+\lambda)c_m}{r}, \tag{62}$$

$$[U_b^*]^z = U_g^* - (U_g^* - U_b^*) \tag{63}$$

$$= \frac{b + m(\theta_g)\left(\frac{\beta}{1-\beta}(c\theta_g + (1 - F(\underline{x}_g))c_f\right) - (r+\lambda)([U_g^*]^z - [U_b^*]^z)}{r} \tag{64}$$

It is useful to describe the value of being unemployed in a bad region with reference to the one in a good region. In the FM case, the difference is equal to c_m. Hence, their value is exactly the same as in the good region, except that they need to migrate now in order to enjoy it. In the ZM case, unemployed workers in a bad region suffer from the loss of being there now, compared to the unemployed in a good region.

Let us now turn to the values of being employed. First, consider the case of employed workers in a good region and in a surviving job:

$$[W_g^s(x)]^f = (1-\beta)[U_g^*]^f + \beta\left(\frac{x}{r} + \frac{(r+\lambda)}{r(r+2\lambda)}\varepsilon_g + c_f\right), \tag{65}$$

$$[W_g^s(x)]^z = (1-\beta)[U_g^*]^z + \beta\left(\frac{x}{r} + \frac{(r+\lambda)}{r(r+2\lambda)}\varepsilon_g + c_f\right), \tag{66}$$

The difference between the respective values is determined by the difference in their outside option, which is being unemployed in a good region. Employ-

[7] See Appendix 7.1 for formal derivations

ment protection gives them some insider power but also reduces the value of their outside option.

In bad regions, surviving jobs lead to the following values of being employed:

$$[W_b(x)]^f = (1-\beta)([U_g^*]^f - c_m) + \beta\left(\frac{x}{r} + c_f\right), \tag{67}$$

$$[W_b(x)]^z = (1-\beta)([U_g^*]^z - ([U_g^*]^z - [U_b^*]^z)) + \beta\left(\frac{x}{r} + c_f\right), \tag{68}$$

Employment protection plays the same role as in the surviving jobs in a good region.

Finally, let us consider employed workers in dying jobs (in a good region only):

$$[W_g^d(x)]^f = (1-\beta)[U_g^*]^f + \beta\left(\frac{x}{r+\lambda} + \frac{\lambda([U_g^*]^f - c_m)}{r+\lambda} + \frac{\varepsilon_g}{r+\lambda} + \frac{rc_f}{r+\lambda}\right), \tag{69}$$

$$[W_g^d(x)]^z = (1-\beta)[U_g^*]^z + \beta\left(\frac{x}{r+\lambda} + \frac{\lambda([U_g^*]^z - ([U_g^*]^x - [U_b^*]^z))}{r+\lambda} + \frac{\varepsilon_g}{r+\lambda} + \frac{rc_f}{r+\lambda}\right) \tag{70}$$

Here, the outside option of the unemployed workers matter for the bargaining at the beginning of the employment relationship but also for the future, since these workers know their jobs will be destroyed as soon as the region falls into a slump.

In conclusion, the economic heterogeneity and the migration costs determine the extent to which the outside option is altered by employment protection and hence, the preferences of the workers (unemployed and employed) with that respect.

Let us now turn to our numerical experiment.

4 A numerical experiment

In this section, we solve the model explicitly for several configurations of parameters. The idea is to show that the preferences of the workers with respect to employment protection are different in a zero-migration equilibrium than in a full-migration equilibrium.

4.1 Basic example

Our basic numerical example is based on the following assumptions. First, we assume that $f(x)$ is a uniform distribution defined on the interval $[0, 1]$. We feature what happens under two different systems: without employment protection ($c_f = 0$) and with employment protection ($c_f = 0.5$), this in each equilibrium (zero-migration and full-migration). We propose the following form for the matching function: $m(\theta) = a\theta^{\alpha}$, with $\alpha > 0$.

[Insert Table 2 here]

Assume that one period of time corresponds to half a year. The expected duration of a boom or a slump is then equal to $\frac{1}{\lambda}0.5 = 2.5$ years, which seems a reasonable length for each state of the world. The size of the aggregate productivity differential can be related to other variables in the model such as the average wage that we compute below.

We first describe the characteristics of the economy under each system and then look at the preferences of the workers.

[Insert Table 3 here]

Table 3 shows essential features of the two economies. In our example, the steady-state unemployment rate is higher in the FM equilibrium than in the ZM equilibrium. Furthermore, the share of dying jobs is larger in the FM equilibrium. Indeed, the productivity required at entry is relatively smaller in the FM case and, on the other hand, the productivity threshold between surviving jobs and dying jobs is higher than in the ZM equilibrium. Hence, the equilibrium flows out of and into unemployment are larger in the country that has the lowest migration cost. Employment protection reduces job creation (through its negative effect on vacancy posting and its positive effect on the productivity required at entry) and job destruction (through its negative effect on the firing productivity floor $\widetilde{x}$). It therefore reduces the equilibrium flows out of and into unemployment.

Let us now turn to the political equilibrium.

Graphs 1.1 - 1.4 plot the value functions for the workers in both systems, against the match-specific productivity x. The dashed line corresponds in all graphs to the asset value of a worker, in the absence of employment protection (i.e. $c_f = 0$), as a function of her position on the labor market (her position changes with x from unemployed to employed in a dying job and, finally, employed in a surviving job). The continuous line on the other hand plots the asset value of a worker in the presence of employment protection ($c_f = 0.5$).They include all categories of workers, except the unemployed who did not match with any firm. The asset value for these unemployed corresponds however exactly to the asset value of the unemployed who did get a match but not productive enough to lead to a contract.

Graph 1.1 and 1.2 present to the value functions in the good region in the FM and ZM equilibria respectively and Graph 1.3 and 1.4 present the value functions in the bad region for both equilibria again. We see that unemployed are better off with no employment protection, in both equilibria. Unemployed workers care more about finding a job in the present than enjoying insider gains in the future. Employed workers who would be in a dying job without employment protection and unemployed if there was employment protection also prefer no employment protection in either equilibrium. All other employed workers on the other hand differ in their preferences according to the equilibrium type. In the full migration equilibrium, they all would vote against employment protection, while in the zero migration equilibrium, they would vote in favor of it. Given that these employed workers are in majority in both equilibria, we conclude that the political equilibrium in our example is different in both equilibria. Among these workers, three categories can be distinguished: workers who would be in a dying job in either system, workers who would be in a dying job in the "no-employment protection system" and in a surviving job in the "employment protection system" and, finally, workers who would be in a surviving job in either system. Low productive workers prefer no employment protection when migration is costless. They trade insider gains for high job finding and firing rates, so that they can move fast to better horizons rather than being maintained in low productive activities. In our example, more productive workers prefer no employment protection. The reason is that their outside option is then much better than with employment protection. The gains from high mobility possibilities dominate the insider gains they could benefit from in a system with employment protection. All these arguments do not hold for workers who cannot migrate to the neighboring region. These workers prefer employment protection in order to enjoy insider gains and, for some of them, have their job safe.

[Insert Graph 1.1-1.4 here]

In this particular example, we find that 73.4% of the workers support employment protection in the zero migration equilibrium against 0% in the full migration equilibrium.

This example shows then that the same configuration of parameters can lead to very different preferences with respect to the employment protection system depending on the migration possibilities. In our example, if the migration cost is higher than 1.16 ($[U_g^*]^z - [U_b^*]^z$) workers do not find it worthwhile to migrate to the neighboring region in order to find a job. Hence, if the migration cost is somewhat larger than the productivity differential it is not profitable to move and the majority of workers prefer employment to be protected by a firing cost.

Furthermore, we find the two sides of the relationship between migration and employment protection: The difference between the two equilibria indicate that a lower migration cost makes employment protection less attractive. The difference between the two last columns of Table 2 shows that a stronger employment protection reduces the number of workers migrating (since the proportion of dying jobs $\widetilde{x} - \underline{x}_g$ is the lowest with employment protection and all fired workers migrate).

4.2 Sensitivity analysis

4.2.1 Modifying parameters λ and ε_g

In addition to the migration costs, we argued that the degree of economic heterogeneity played an important role in determining the preferences of the workers.

Hence, two parameters are likely to play an important role in determining the political equilibrium: the transition probability between the states of the world (λ) and the regional productivity differential (ε_g). We expect that an increase in the parameters λ and ε_g lead to a fall in the political support for EPL. We report the results in Table 4. Indeed we find that the political support drops with these two parameters. Also striking is the "sudden drop" in political support at some critical values. The reason for this is that the valuation functions are parallel, so that at one point, all the workers in surviving jobs prefer no employment protection and this brings the share of voters to 0.

[Insert Table 4 here]

Hence, we argue that the size of the United states (and the economic diversity associated with it) contributes to the low support for employment protection.

4.2.2 Modifying the political choice

Our example assumed a simple choice between no employment protection and employment protection. The political choice in the real world is certainly more complex than that. What is important is that our simple example enables us to draw the following conclusion: Ceteris Paribus (i.e. given a configuration of parameters), countries with a relatively low migration cost demand a lower level of employment protection than countries with a high migration cost. The configuration of parameters determine the level of employment protection that is preferred. Hence, we showed that when the regional productivity differentials were low some workers would prefer to have some employment protection.

4.2.3 The distribution function $f(x)$

We assumed that the distribution of productivities was uniform, which does probably not fit the real world either. One should expect that the density of low skilled matches should be higher than in this example. In the full migration equilibrium especially, those are the people who matter in the political choice, i.e. this is the category of workers to which the median voter is likely to belong.

We saw that low productive workers were the first to prefer employment protection once the regional productivity differential was becoming large enough. This means that in reality the switch between political equilibria probably happen even earlier than what our model predicts.

5 Discussion

5.1 Negatively correlated shocks and political entity

Migration and employment protection are inter-related to the extent that one considers the same entities for one and the other, i.e. what determines the preferences of workers with respect to employment protection is the extent to which migration is profitable *within* the country (if one supposes that the country is the level at which employment protection is set).

Hence, the migration costs and economic heterogeneity *between* political entities do not determine in the same way the preferences of the workers with respect to employment protection. Indeed, the levels of employment protection are determined independently in each political entity. For that reason, migration between countries cannot be regarded as a reliable insurance device for the median voter since she has no idea what level of EPL the other entities will choose and so has no idea about how easy it might be to find a job in the neighboring political entity/ies. This means that the barriers to labor mobility between European countries cannot be used here as an argument for the relatively high levels of employment protection in Europe. However what our model can tell concerning the European Union is that if employment protection would be fixed at the European level rather than at the country level there would probably no desire for lower protection. The reason is that, despite a large economic heterogeneity, there are important cultural and language barriers resulting in high migration costs.

In our model the regional shocks are perfectly negatively correlated. Our result relies on the existence of some heterogeneity, this extreme assumption being just made for simplicity.

5.2 Interaction with other institutions

Saint-Paul (1997) argues that the reason why Europeans desire a higher level of employment protection lies in the existence of other institutions, such as powerful unions. One may displace the question one step back and ask why do the Europeans have stronger unions? Indeed, the forces leading to the existence of powerful unions are likely to be similar to the forces leading to the existence of employment protection. The argument used in this paper could be used to justify differences in institutions influencing job creation and insider gains in the same way as employment protection. Hence, generous unemployment insurances (leading to high taxes on labor through a social security budget constraint) and strong unions can also be thought as institutions deterring vacancy posting while providing workers with insider gains. There are number of studies pointing out the differences between the US and Europe from these perspectives (see Hassler et al. (2001) for a recent contribution on the differences in unemployment insurance systems and Wallerstein (1989) for a contribution on the differences in unions structure). Wallerstein observes that there is a negative relationship between the size of the country to the degree of unionization. His argument is that the proportion of the labor force unionized determines the gains from unionization while the size of the labor force determines the costs of unionization (organizational costs). Hence, smaller countries are characterized by stronger unions.

5.3 Firing costs and severance payments

In this paper, we considered the firing cost as a pure waste for the firm and the society. However, employment protection also includes rules guiding the severance payments from the firm to the worker (see OECD (1999)). Adding this type of firing cost would not change anything to our results. The reason is that a severance payment reduces the bargained wages and constitute therefore a kind of forced saving. In our framework, the worker would be completely indifferent between a system with or without severance payment.

6 Concluding remarks

The objective of this paper was to explain the observed differences in employment protection between the United States and European countries. The explanation we provide here is that migration does not work as well as an insurance device in Europe than in the United States. There are two reasons for that: First, the United States form a large country, with a high degree of economic diversity. Most European countries are small and definitely more homogenous than the United States. Second, even in the presence of economic incentives to migration within their country, Europeans do not respond with migration. This suggests that there are important migration costs, that can be linked to institutional structures (such as housing regulations or other welfare support systems) or social and cultural barriers.

In this paper, we argue that the economic heterogeneity and the migration costs play a crucial role in determining the preferences of the workers with respect to employment protection. Employment protection typically reduces the job finding and firing rates and so also reduces the efficiency of migration as an insurance device. Hence, when the structure of the country is such that migration would be attractive, workers are likely to support a "no employment protection" system. If it is not, on the other hand, workers prefer enjoying insider gains and safe jobs.

Our model provides an interesting prediction with respect to the European Union. According to the empirical evidence, Euro-Land is more heterogeneous than the United States. This means that if employment protection would be decided at the European level, it could be that it is not as strongly supported by the workers as before. However, as long as some large social and cultural differences would subsist, it would be maintained strong. Similarly, the implementation of a reform of the employment protection system (if one would be convinced that is welfare-improving) would be much easier to implement in a society made more mobile than in a society where workers are very much attached to their local roots.

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7 Appendix

7.1 Wage bargaining

The wage maximizes the following Nash-bargaining program:

$$w_g^s(x) = \arg\max_{w_g^s(x)} \left(W_g^s(x) - \overline{U}_g\right)^\beta \left(J_g^s(x) - V_g + c_f\right)^{1-\beta}, \tag{71}$$

where $\overline{U}_g$ is the outside option of a worker in a good region. It corresponds to the value of becoming unemployed in a good region and is equal to $\max[U_g^*, U_b^* - c_m]$. We show later that migration from a good to a bad region is never profitable so that $\overline{U}_g = U_g^*$.

In the bad region, the maximization program is:

$$w_g^s(x) = \arg\max_{w_b(x)} \left(W_b(x) - \overline{U}_b\right)^\beta (J_b(x) - V_b + c_f)^{1-\beta}, \tag{72}$$

where $\overline{U}_b$ is the outside option of a worker in a bad region. These workers can either migrate to the neighboring (booming) region or stay in their region. Hence, $\overline{U}_b = \max[U_b^*, U_g^* - c_m]$. In the FM equilibrium all workers find if profitable to migrate, so that $\left[\overline{U}_b\right]^f = [U_g^*]^f - c_m$ and in the ZM equilibrium all unemployed workers stay in their region, so $[\overline{U}_b]^z = [U_b^*]^z$, where the subscripts are self-explanatory.

The first-order conditions are respectively:

$$(1-\beta)\left(W_g^s(x) - \overline{U}_g\right) = \beta(J_g^s(x) - V_g + c_f), \tag{73}$$

$$(1-\beta)\left(W_b(x) - U_b^*\right) = \beta(J_b(x) - V_b + c_f), \tag{74}$$

where:

$$W_g^s(x) = \frac{w_g^s(x) + \lambda W_b(x)}{r+\lambda}, \quad (75)$$

$$W_b(x) = \frac{w_b(x) + \lambda W_g^s(x)}{r+\lambda}, \quad (76)$$

$$J_g^s(x) = \frac{x + \varepsilon_g - w_g^s(x) + \lambda J_b(x)}{r+\lambda}, \quad (77)$$

$$J_b(x) = \frac{x - w_b(x) + \lambda J_g^s(x)}{r+\lambda}, \quad (78)$$

Substituting (75) and (77) in (73) leads to:

$$(1-\beta)\left(\frac{w_g^s(x) + \lambda(W_b(x) - \overline{U}_b) + \lambda\overline{U}_b - (r+\lambda)\overline{U}_g}{r+\lambda}\right) \quad (79)$$

$$= \beta\left(\frac{x^s + \varepsilon_g - w_g^s(x) + \lambda(J_b(x) - V_g) - rV_g + (r+\lambda)c_f}{r+\lambda}\right), \quad (80)$$

Since $V_g = V_b = 0$, we have:

$$(1-\beta)\left(\frac{w_g^s(x) + \lambda(W_b(x) - \overline{U}_b) + \lambda\overline{U}_b - (r+\lambda)\overline{U}_g}{r+\lambda}\right)$$

$$= \beta\left(\frac{x + \varepsilon_g - w_g^s(x) + \lambda(J_b(x)) + c_f) + rc_f}{r+\lambda}\right), \quad (81)$$

Using the F.O.C. for the stagnating region, i.e. substituting (74) into (**??**), we have:

$$(1-\beta)\left(\frac{w_g^s(x) + \lambda\overline{U}_b - (r+\lambda)\overline{U}_g}{r+\lambda}\right) = \beta\left(\frac{x + \varepsilon_g - w_g^s(x) + rc_f}{r+\lambda}\right), \quad (82)$$

The equilibrium wage $w_g^s(x)^*$ is then:

$$w_g^s(x)^* = (1-\beta)((r+\lambda)\overline{U}_g - \lambda\overline{U}_b) + \beta\,(x + \varepsilon_g + rc_f)\,, \quad (83)$$

The same reasoning is applied to calculate the equilibrium wage in the stagnating region $w_b(x)^*$. We then get that:

$$w_b(x)^* = (1-\beta)((r+\lambda)\overline{U}_b - \lambda\overline{U}_g) + \beta\,(x + rc_f)\,, \tag{84}$$

The maximization program for a dying job is the following:

$$w_g^d(x) = \arg\max_{w_g^d(x)} \left(W_g^d(x) - \overline{U}_g\right)^{\beta} (J_g^d(x) - V_g + c_f)^{1-\beta}, \tag{85}$$

The first-order condition is then:

$$(1-\beta)\left(W_g^d(x) - \overline{U}_g\right) = \beta(J_g^d(x) - V_g + c_f), \tag{86}$$

where:

$$W_g^d(x) = \frac{w_g^d(x) + \lambda\overline{U}_b}{r+\lambda}, \tag{87}$$

$$J_g^d(x) = \frac{x + \varepsilon_g - w_g^d(x) + \lambda(V_b - c_f)}{r+\lambda} \tag{88}$$

Substituting (87) and (88) in (86) and knowing that $V_g = V_b = 0$, we get:

$$(1-\beta)\left(w_g^d(x) + \lambda(\overline{U}_b - \overline{U}_g) - r\overline{U}_g\right) = \beta(x + \varepsilon_g - w_g^d(x) + rc_f), \tag{89}$$

The equilibrium wage for a dying job in a booming region $w_g^d(x)^*$ is then:

$$w_g^d(x)^* = (1-\beta)\left(\lambda(\overline{U}_g - \overline{U}_b) + r\overline{U}_g\right) + \beta(x + \varepsilon_g + rc_f), \tag{90}$$

Let us characterize the wages in the FM and ZM cases:

The equilibrium wage structure associated with the FM equilibrium is computed by substituting $\left[\overline{U}_g\right]^f = [U_g^*]^f$ and $[\overline{U}_b]^f = [U_g^*]^f - c_m$.

$$[w_g^s(x)^*]^f = (1-\beta)(r[U_g^*]^f + \lambda c_m) + \beta\,(x + \varepsilon_g + rc_f)\,, \tag{91}$$

$$[w_b(x)^*]^f = (1-\beta)((r+\lambda)([U_g^*]^f - c_m) - \lambda[U_g^*]^f) + \beta\,(x + rc_f)\,, \tag{92}$$

$$[w_g^d(x)^*]^f = (1-\beta)\left(r[U_g^*]^f + \lambda c_m\right) + \beta(x+\varepsilon_g + rc_f), \tag{93}$$

The equilibrium wage structure associated with the ZM equilibrium is computed by substituting $[U_g]^z = [U_g^*]^z$ and $[U_b]^z = [U_b^*]^z$.

$$[w_g^s(x)^*]^z = (1-\beta)(r[U_g^*]^z + \lambda([U_g^*]^z - [U_b^*]^z)) + \beta\left(x+\varepsilon_g + rc_f\right), \tag{94}$$

$$[w_b(x)^*]^z = (1-\beta)((r+\lambda)[U_b^*]^z - \lambda[U_g^*]^z) + \beta\left(x + rc_f\right), \tag{95}$$

$$[w_g^d(x)^*]^z = (1-\beta)\left(r[U_g^*]^z + \lambda([U_g^*]^z - [U_b^*]^z\right) + \beta(x+\varepsilon_g + rc_f), \tag{96}$$

The equilibrium value of being unemployed can now be derived:

The value of being unemployed in a good region is:

$$rU_g^* = b + m(\theta_g^*)\left(E(W_g(x)) - (1-F(\underline{x}_g^*))U_g^*\right) + \lambda(U_b^* - U_g^*), \tag{97}$$

and,

$$rU_b^* = b + m(\theta_b^*)\left(E(W_b(x)) - (1-F(\underline{x}_b^*))U_b^*\right) + \lambda(U_g^* - U_b^*), \tag{98}$$

and on the other hand we have:

$$E(W_g(x)) - (1-F(\underline{x}_g^*))U_g^* = \frac{\beta}{1-\beta}(E(J_g(x) - V_g) + c_f(1-F(\underline{x}_g^*)), \tag{99}$$

$$E(W_g(x)) - (1-F(\underline{x}_g^*))U_g^* = \frac{\beta}{1-\beta}\left(\frac{c}{q(\theta_g)} + c_f(1-F(\underline{x}_g^*)\right), \tag{100}$$

and

$$E(W_b(x)) - (1-F(\underline{x}_b^*))U_b^* = \frac{\beta}{1-\beta}(E(J_b(x) - V_b) + c_f(1-F(\underline{x}_b^*)), \tag{101}$$

$$E(W_b(x)) - (1 - F(\underline{x}_b^*))U_b^* = \frac{\beta}{1-\beta}\left(\frac{c}{q(\theta_b^*)} + c_f(1 - F(\underline{x}_b^*)\right), \tag{102}$$

that we can substitute in the values of being unemployed:

$$\begin{aligned}(r+2\lambda)U_g^* &= \begin{array}{c}(r+\lambda)\left[b + \left(\frac{\beta}{1-\beta}\left(c\theta_g^* + c_f m(\theta_g^*)(1-F(\underline{x}_g^*))\right)\right)\right] \\ +\lambda\left[b + \left(\frac{\beta}{1-\beta}\left(c\theta_b^* + c_f m(\theta_b^*)(1-F(\underline{x}_b^*))\right)\right)\right],\end{array} \quad (103) \\ (r+2\lambda)U_b^* &= \begin{array}{c}(r+\lambda)\left[b + \left(\frac{\beta}{1-\beta}\left(c\theta_b^* + c_f m(\theta_b^*)(1-F(\underline{x}_b^*))\right)\right)\right] \\ +\lambda\left[b + \left(\frac{\beta}{1-\beta}\left(c\theta_g^* + c_f m(\theta_g^*)(1-F(\underline{x}_g^*))\right)\right)\right],\end{array} \quad (104)\end{aligned}$$

Lemma 20 $\theta_g^* \begin{smallmatrix}\geq \\ \leq\end{smallmatrix} \theta_b^* \Leftrightarrow U_g^* \begin{smallmatrix}\geq \\ \leq\end{smallmatrix} U_b^*$.

Proof. Straightforward, given that we have already shown that $\underline{x}_g \leq \underline{x}_b$. ∎

7.2 Matching values

Let us calculate the values of filling a vacancy with a match of productivity x: $J_g^s(x), J_g^d(x)$ and $J_b(x)$.

$$\begin{aligned} J_g^s(x) &= \frac{x^s + \varepsilon_g - w_g^s(x) + \lambda J_b(x)}{r+\lambda}, \quad (105) \\ J_b(x) &= \frac{x - w_b(x) + \lambda J_g^s(x)}{r+\lambda}, \quad (106)\end{aligned}$$

Hence, we have:

$$J_g^s(x) = \frac{(r+2\lambda)\,x + (r+\lambda)\,\varepsilon_g - (r+\lambda)\,w_g^s(x) - \lambda w_b(x)}{r\,(r+2\lambda)}, \tag{107}$$

and similarly:

$$J_b(x) = \frac{(r+2\lambda)\,x + \lambda\varepsilon_g - (r+\lambda)\,w_b(x) - \lambda w_g^s(x)}{r\,(r+2\lambda)}, \tag{108}$$

Substituting for the equilibrium bargained wages $w_b(x)$ and $w_g^s(x)$:

$$J_g^s(x) = \frac{\begin{array}{c}(1-\beta)\,(r+2\lambda)\,x + (1-\beta)\,(r+\lambda)\,\varepsilon_g \\ -(1-\beta)\left(r\,(r+2\lambda)\,\overline{U}_g\right) - (r+2\lambda)\,\beta r c_f\end{array}}{r\,(r+2\lambda)}, \tag{109}$$

and similarly:

$$J_g^b(x) = \frac{\begin{array}{c}(1-\beta)\,(r+2\lambda)\,x + (1-\beta)\,\lambda\varepsilon_g \\ -(1-\beta)\left(r\,(r+2\lambda)\,\overline{U}_b\right) - (r+2\lambda)\,\beta r c_f\end{array}}{r\,(r+2\lambda)}, \tag{110}$$

The value of filling a vacancy with a dying job is on the other hand:

$$J_g^d(x) = \frac{x + \varepsilon_g - w_g^d(x) + \lambda(V_b - c_f)}{r+\lambda}, \tag{111}$$

Substituting for the bargained wage $w_g^d(x)$ we get:

$$J_g^d(x) = \frac{(1-\beta)(x+\varepsilon_g) - (1-\beta)\left(\lambda(\overline{U}_g - \overline{U}_b) + r\overline{U}_g\right) - (r\beta+\lambda)c_f}{r+\lambda}, \tag{112}$$

Let us now consider the worker's side:

$$W_g^s(x) = \frac{w_g^s(x) + \lambda \frac{w_b(x) + \lambda W_g^s(x)}{r+\lambda}}{r+\lambda}, \tag{113}$$

$$\Longleftrightarrow W_g^s(x) = \frac{w_g^s(x)\,(r+\lambda) + \lambda w_b(x)}{r\,(r+2\lambda)}, \tag{114}$$

Substituting for the equilibrium wages $w_g^s(x)$ and $w_g^d(x)$ we find:

$$\Longleftrightarrow W_g^s(x) = (1-\beta)\overline{U}_g + \beta\left(\frac{x}{r} + \frac{(r+\lambda)}{r\,(r+2\lambda)}\varepsilon_g + c_f\right), \tag{115}$$

and similarly:

$$W_b(x) = (1-\beta)\overline{U}_b + \beta\left(\frac{x}{r} + c_f\right), \tag{116}$$

On the other hand we have:

$$W_g^d(x) = \frac{w_g^d(x) + \lambda\overline{U}_b}{r+\lambda}, \tag{117}$$

$$\Longleftrightarrow W_g^d(x) = (1-\beta)U_g + \beta\left(\frac{x}{r+\lambda} + \frac{\lambda\overline{U}_b}{r+\lambda} + \frac{\varepsilon_g}{r+\lambda} + \frac{rc_f}{r+\lambda}\right) \tag{118}$$

Note that

$$W_g^d(\widetilde{x}_{d,s}) = W_g^s(\widetilde{x}_{d,s}), \tag{119}$$

On the other hand, we have $\frac{\partial W_g^d(x)}{\partial x} > \frac{\partial W_g^s(x)}{\partial x}$. Hence, workers on surviving jobs are also wanting their jobs to survive.

7.3 Thresholds

Let us now calculate the "employment" productivity thresholds $\underline{x}_g$ and $\underline{x}_b$ and the threshold $\widetilde{x}$.

$$\underline{x}_g = Min[\underline{x}_g^d, \underline{x}_g^s], \tag{120}$$

where $\underline{x}_g^d$ is such that $J_g^d(\underline{x}_g^d) = 0$, and $\underline{x}_g^s$ is such that $J_g^s(\underline{x}_g^s) = 0$.

Hence, $\underline{x}_g^s$ is such that:

$$J_g^s(\underline{x}_g^s) = \frac{\begin{array}{c}(1-\beta)(r+2\lambda)\underline{x}_g^s + (1-\beta)(r+\lambda)\varepsilon_g \\ -(1-\beta)\left(r(r+2\lambda)\overline{U}_g\right) - (r+2\lambda)\beta r c_f\end{array}}{r(r+2\lambda)} = 0, \tag{121}$$

$$\Longleftrightarrow \underline{x}_g^s = -\frac{r+\lambda}{r+2\lambda}\varepsilon_g + r\overline{U}_g + \frac{\beta}{1-\beta} r c_f, \tag{122}$$

Hence $\underline{x}_b$ is such that:

$$J_g^b(\underline{x}_b) = \frac{\begin{array}{c}(1-\beta)(r+2\lambda)\underline{x}_b + (1-\beta)\lambda\varepsilon_g \\ -(1-\beta)\left(r(r+2\lambda)\overline{U}_b\right) - (r+2\lambda)\beta r c_f\end{array}}{r(r+2\lambda)} = 0, \tag{123}$$

$$\Longleftrightarrow \underline{x}_b = -\frac{\lambda}{(r+2\lambda)}\varepsilon_g + r\overline{U}_b + \frac{\beta r c_f}{1-\beta}, \tag{124}$$

and so $\underline{x}_g^d$ is such that:

$$J_g^d(\underline{x}_g^d) = \frac{(1-\beta)(\underline{x}_g^d + \varepsilon_g) - (1-\beta)\left(\lambda(\overline{U}_g - \overline{U}_b) + r\overline{U}_g\right) - (r\beta+\lambda)c_f}{r+\lambda} = 0, \tag{125}$$

$$\Longleftrightarrow \underline{x}_g^d = -\varepsilon_g + \left(\lambda(\overline{U}_g - \overline{U}_b) + r\overline{U}_g\right) + \frac{(r\beta+\lambda)}{1-\beta}c_f, \tag{126}$$

The threshold between a dying and surviving job $\widetilde{x}$ is defined as follows:

$$\widetilde{x} = \min\{\underline{x}_g^s, \widetilde{x}_{d,s}\}, \tag{127}$$

where $\widetilde{x}_{d,s}$ is such that:

$$J_g^d(\widetilde{x}_{d,s}) = J_g^s(\widetilde{x}_{d,s}), \tag{128}$$

$$\Longleftrightarrow (1-\beta)\frac{\widetilde{x}_{d,s}}{r} + (1-\beta)\frac{(r+\lambda)\,\varepsilon_g}{r\,(r+2\lambda)} - (1-\beta)\overline{U}_g - \beta c_f$$
$$=$$
$$(1-\beta)\frac{\widetilde{x}_{d,s}}{r+\lambda} + (1-\beta)\frac{\varepsilon_g}{r+\lambda} - (1-\beta)\frac{\left(\lambda(\overline{U}_g - \overline{U}_b) + r\overline{U}_g\right)}{r+\lambda} - \frac{(r\beta+\lambda)}{r+\lambda}c_f \tag{129}$$

$$\Longleftrightarrow \widetilde{x}_{d,s} = -\frac{\lambda\varepsilon_g}{(r+2\lambda)} + \frac{r\overline{U}_b}{r+\lambda} - rc_f \tag{130}$$

Furthermore we have $\frac{\partial J_g^d(x)}{\partial x} > \frac{\partial J_g^s(x)}{\partial x}$ so that firms are indeed wanting surviving jobs to survive.

7.4 Proof of proposition 12

Suppose there are no dying jobs. Then $J_g^s(x)^* \geq (\leq) J_b(x)^* \Rightarrow \underline{x}_b \geq (\leq)\underline{x}_g^s \Rightarrow E(J_g) \geq (\leq)E(J_b) \Rightarrow \theta_g^* \geq (\leq)\theta_b^*$
Suppose there are dying jobs, Then $J_g^s(x)^* \geq (\leq)J_b(x)^* \Rightarrow \underline{x}_b \geq (\leq)\underline{x}_g^s$ and $\forall x \in [\underline{x}_g^d, \widetilde{x}]$:$J_g^d(x)^* \geq J_g^s(x)^* \Rightarrow \underline{x}_g^d \leq \underline{x}_g^s \leq \underline{x}_b$ and $\underline{x}_g^d \leq \widetilde{x} \Rightarrow E(J_g) \geq (\leq)E(J_b) \Rightarrow \theta_g^* \geq (\leq)\theta_b^*$

7.5 Proof of proposition 14

In the good region:

$$\frac{\partial E(J_g)}{\partial c_f} = \left[-\frac{r\beta+\lambda}{r+\lambda}(F(\widetilde{x}) - F(\underline{x}_g^d)) - \beta(1-F(\widetilde{x}))\right], \tag{131}$$

Since f(x) is a uniform distribution defined on the interval $[0,1]$, we have:

$$\frac{\partial E(J_g)}{\partial c_f} = \left[-\frac{r\beta+\lambda}{r+\lambda}(\widetilde{x} - \underline{x}_g^d) - \beta(1-\widetilde{x})\right], \tag{132}$$

Substituting for $\widetilde{x}$ and $\underline{x}_g^d$:

$$\frac{\partial E(J_g)}{\partial c_f} = -\frac{\lambda(1-\beta)}{r+\lambda}\widetilde{x} + \frac{r\beta+\lambda}{r+\lambda}\underline{x}_g^d - \beta, \tag{133}$$

$$= \frac{\lambda(1-\beta)}{r+\lambda}\left[\frac{\lambda\varepsilon_g}{(r+2\lambda)} - \frac{r\overline{U}_b}{r+\lambda} + rc_f\right] \tag{134}$$

$$+\frac{r\beta+\lambda}{r+\lambda}\left[-\varepsilon_g + \left(\lambda(\overline{U}_g - \overline{U}_b) + r\overline{U}_g\right) + \frac{(r\beta+\lambda)}{1-\beta}c_f\right] \tag{135}$$

$$-\beta, \tag{136}$$

Hence, given $\overline{U}_g$ and $\overline{U}_b$:

$$\frac{\partial^2 E(J_g)}{\partial c_f \partial \varepsilon_g} = \frac{-(1-\beta)\lambda^2 - r^2\beta - 3\lambda r}{(r+\lambda)(r+2\lambda)} < 0, \tag{137}$$

Furthermore, given $\overline{U}_g$:

$$\frac{\partial^2 E(J_g)}{\partial c_f \partial(\overline{U}_g - \overline{U}_b)} = \lambda\frac{r\beta+\lambda}{r+\lambda} > 0, \tag{138}$$

Hence, high economic heterogeneity and low good-region insider power magnify the negative effect of the firing cost on the expected value of filling a vacancy in the good region.

In the bad region:

$$\frac{\partial E(J_b)}{\partial c_f} = -\beta(1 - F(\underline{x}_b)), \tag{139}$$

Substituting for $\underline{x}_b$:

$$\frac{\partial E(J_b)}{\partial c_f} = -\beta(1 + \frac{\lambda}{(r+2\lambda)}\varepsilon_g - r\overline{U}_b - \frac{\beta r c_f}{1-\beta}), \tag{140}$$

Given $\overline{U}_b$, we then have:

$$\frac{\partial^2 E(J_b)}{\partial c_f \partial \varepsilon_g} = -\beta\frac{\lambda}{(r+2\lambda)}\varepsilon_g < 0, \tag{141}$$

Hence, also in the bad region, a larger economic heterogeneity amplifies the negative effect of the firing cost on the expected value of filling a vacancy in the bad region.

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Table 1 - Summary of EPL indicators

	Overall strictness of protection against dismissals		Overall strictness of regulation of fixed-term contracts		Overall strictness of regulation of temporary work agencies	
	Late 80s	Late 90s	Late 80s	Late 90s	Late 80s	Late 90s
Anglo-Saxon countries						
United States	0.2	0.2	0	0	0.5	0.5
United Kingdom	0.8	0.8	0	0	0.5	0.5
Canada	0.9	0.9	0	0	0.5	0.5
Australia	1.0	1.0	1.3	1.3	0.5	0.5
Ireland	1.6	1.6	0	0	0.5	0.5
New Zealand		1.7		0.3		0.5
Contintental Europe (West)						
Switzerland	1.2	1.2	1.3	1.3	0.5	0.5
Belgium	1.5	1.5	5.3	*2*	4	3.5
France	2.3	2.3	3.5	**4**	2.6	**3.3**
Austria	2.6	2.6	1.8	1.8	1.8	1.8
Germany	2.7	**2.8**	3.5	*1.8*	4	*2.8*
Netherlands	3.1	3.1	1.5	0.8	3.3	*1.6*
Norhern Europe						
Denmark	1.6	1.6	1.3	1.3	4	*0.5*
Finland	2.7	*2.1*	3.3	3.3	0.5	0.5
Norway	2.4	2.4	3.3	3.3	3.8	2.3
Sweden	2.8	2.8	2.7	*1.8*	5.5	*1.5*
Southern Europe						
Greece	2.5	*2.4*	4	4	5.5	5.5
Spain	3.9	2.6	1.5	**3**	5.5	*4*
Italy	2.8	2.8	5.3	4.3	5.5	3.3
Portugal	4.8	4.3	2.3	2.3	4.5	3.8

Source: OECD, 1999

Table 2 - Parameter values

Parameter	Value
Recruitment cost c_r	1
Discount rate r	0.05
Matching elasticity α	0.5
Matching efficienty a	1
Worker's relative bargaining power β	0.5
Probability of a transition λ	0.2
Regional productivity increment ε_g	1
Value of leisure / unemployment benefit b	0.2
Migration cost FM - ZM	0 - >1.16

Table 3 - Characteristics of the economy

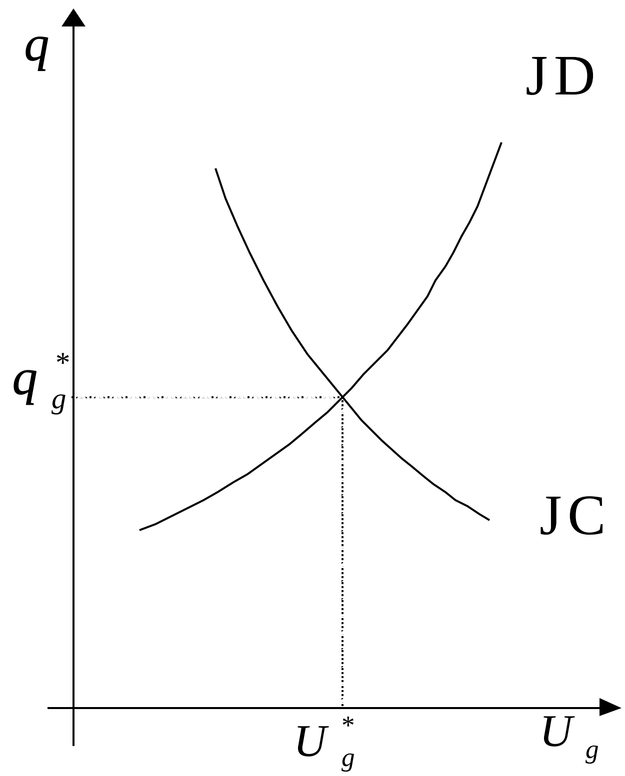
	ZM		FM	
	No EPL	EPL	No EPL	EPL
u_g(%)	2.6	0.9	8.1	8.9
u_b(%)	6.4	1.7	-	-
$u_g + u_b$(%)	9.0	2.6	8.1	8.9
$\underline{x}_g$	0.34	0.53	0.17	0.37
$\widetilde{x}$	0.60	0.57	0.73	0.67
$\underline{x}_b$	0.60	0.62	0.73	0.72
θ_g	1.14	0.9	0.97	0.68
θ_b	0.62	0.89	-	
Unemployment outflow/inflow (%)	3.8	0.9	6.6	4.6
Average wage (good region)	1.00	0.72	1.14	0.90
Average wage (bad region)	0.32	0.31	0.28	0.33

No EPL: c_f=0, EPL:c_f=0.5

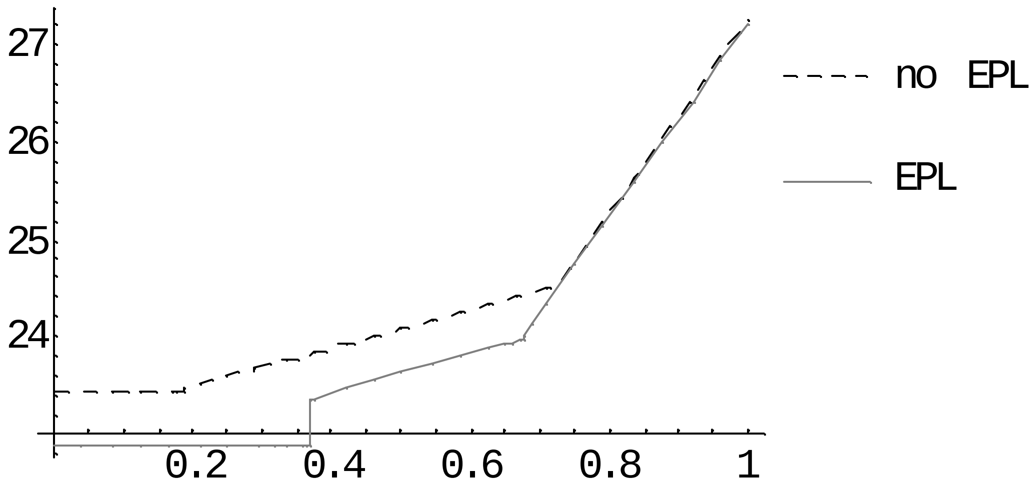
Table 4 - Political support for EPL in the FM equilibrium

$\varepsilon_g \longrightarrow$ $\lambda \downarrow$	*0.1*	*0.2*	*0.4*	*0.6*	*0.8*	*0.9*	*1.0*
0.1	94.1	86.5	75.6	67.7	61.2	**58.2**	**0**
0.2	92.2	84.4	74.4	67.8	62.8	**0**	**0**
0.3	90.4	82.1	72.2	66.0	61.6	**0**	**0**
0.4	88.6	79.8	69.7	63.8	59.6	**0**	**0**
0.5	86.9	77.5	67.2	61.3	57.3	**0**	**0**
0.6	85.1	75.2	62.7	58.8	54.8	**0**	**0**
0.7	83.4	73.0	62.2	56.3	52.3	**0**	**0**
0.8	81.7	70.9	59.7	53.8	**49.8**	**0**	**0**
0.9	80.0	68.8	57.3	51.3	**47.3**	**0**	**0**

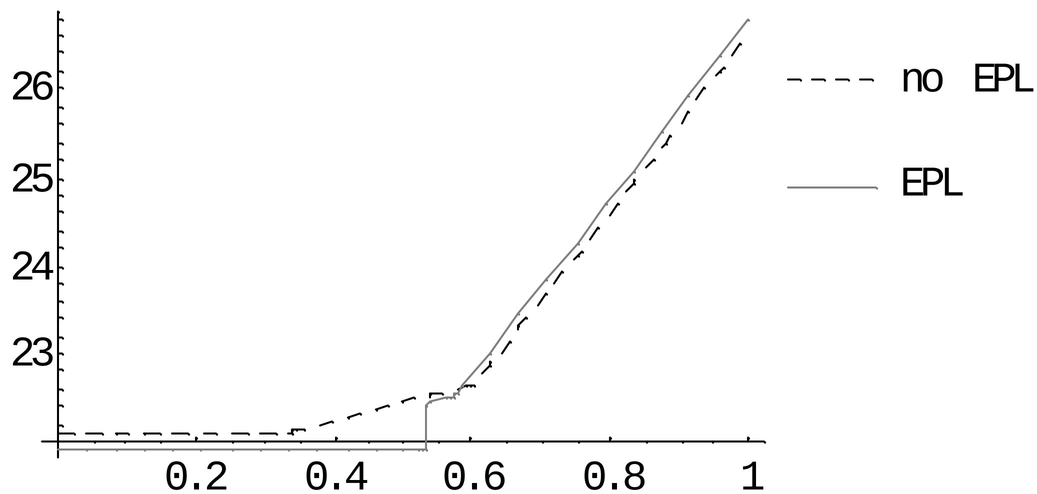
Graph 1.0 – Job creation and job destruction



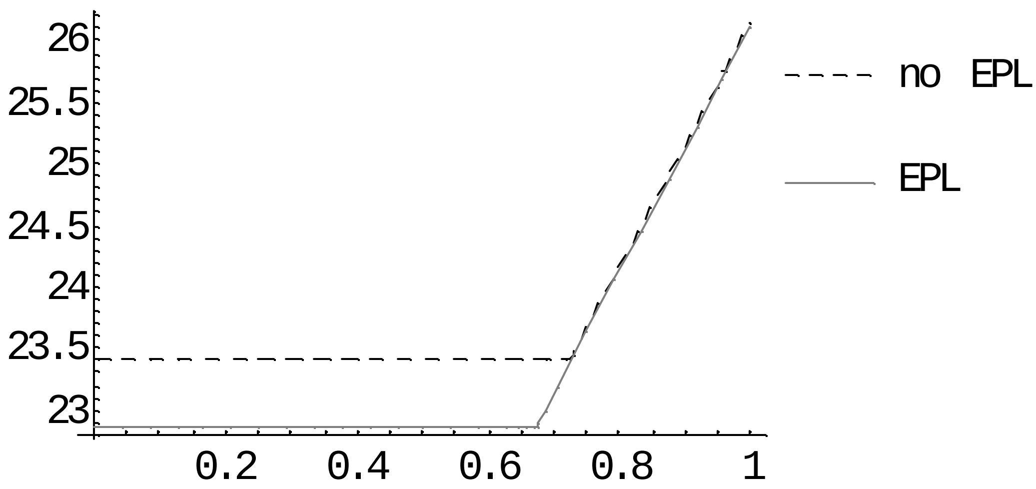
Graph 1.1 – Full migration – Voting preferences – Good region



Graph 1.2 – Zero migration – Voting preferences – Good region



Graph 1.3 – Full migration – Voting preferences – Bad region



Graph 1.4 – Zero migration – Voting preferences – Bad region