

**FRENCH UNEMPLOYMENT :  
A TRANSATLANTIC PERSPECTIVE**

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## **FRENCH UNEMPLOYMENT: A TRANSATLANTIC PERSPECTIVE**

### **ABSTRACT**

The paper compares French and US labour markets. It shows that differences in unemployment rates are especially acute for young and old workers, but appear to be negligible for middle aged workers. All French workers, however, experience quite distinct job flows from their American counterparts as they are exposed to long spells of infrequent unemployment which is the opposite to the US case. Critical differences across ages and skills regarding the patterns of exit and entry out of and into employment are also displayed. We dispel the view that these differences originate from the behaviour of the unemployed (or the set of institutions that guide their decisions), or the view that these features are « new » to the French labour market.

### **CHOMAGE FRANCAIS : UNE PERSPECTIVE TRANSATLANTIQUE**

### **RESUME**

L'article compare le chômage français et le chômage américain. Il montre tout d'abord que les différences sont particulièrement vives pour les jeunes et les vieux chômeurs, mais sont négligeables pour les travailleurs âgés de 25 à 50 ans. Dans tous les cas, toutefois, les travailleurs français sont soumis à des flux très différents de leurs homologues américains. Ces derniers connaissent des passages par le chômage qui sont cinq fois plus fréquents que les Français, mais qui durent également cinq fois moins longtemps. Nous écartons l'hypothèse selon laquelle ces différences pourraient être dues aux chômeurs eux-mêmes (ou aux systèmes d'allocation chômage qui guident leurs décisions), ou l'idée que ces différences doivent à un nouveau mode de fonctionnement du marché du travail.

**MOTS CLES :** Chômage, Croissance Economique, Créations d'Emploi, Destruction d'Emploi.

**KEYWORDS :** Unemployment, Economic Growth, Hirings, Separations.

**JEL :** J11, J20, J62

## 1. INTRODUCTION

'Moneyless America, Jobless Europe': this Paul Krugman verdict over cross Atlantic differences is well known and well documented. Many economists would argue that the sharp difference between the employment performance of the two economies is due to the institutional rigidities of the French labour market, most notably the minimum wage, unemployment benefits and employment protection legislation. In particular, it is often said that French unemployment is specifically tough on young workers, because they enter the labour market for the first time and suffer from a typically "outsider" problem. It is also argued that French low wage unemployed workers are put to a disadvantage by the system, to the extent that they suffer from minimum wage regulation<sup>2</sup>. As a simple test of the validity of these claims, we have analysed differentially the unemployment record of French and US workers. Are the low wage workers suffering relatively more in France than in the US? Do the young workers find it more difficult in France than in the US to find a job, etc...? If not, then their worse labour market outcomes cannot be ascribed to French labour market rigidities but rather to fundamental features of the economy.

Our results can be summarised as follows. Let us first consider the male workers aged 25-50. For this category, the comparison between French and US labour markets points to a simple conclusion: the unemployment rates are the same, both in average and skill by skill! For instance, workers with the lowest educational record (and the same would go for the workers in the lowest quartile) experience an unemployment rate of 10% in both countries, while workers with the highest educational record experience an unemployment rate of 5% (in each country as well). From this perspective, the French system does not appear to be so different from the US system, at least for this category of workers. Even for these workers, however, the flows in and out of unemployment are totally different. French workers (of all skill categories) experience long spells of infrequent unemployment: on average, unemployment occurs five times less often, and last five times longer than in the US. In addition, across skills, the flows are also quite distinct: in the US the higher unemployment rate of the unskilled originates from a higher job loss rate, while in France it originates from a lower hiring rate.

Where does this low separation/low hiring pictures originates from? One possible explanation regarding their low hiring rate is that French workers lack the « flexibility » of their American counterparts, especially when it comes to find a new job. Minimum wage or unemployment benefits would make it harder or less pressing to « underbid » other workers, hence the low hiring rate. As a simple way to test this hypothesis, we have examined the patterns of wages of unemployed workers. To our surprise, we found a great similarity in the wage discount that a formerly displaced worker has to accept in order to re-enter the job market (in each country the average discount is about 10%). We take these results as an indication that the different patterns of hiring rates do not originate from the fact that French unemployed workers behave differently, but arise from differences in the firm/employee relationship *after* hiring.

In the last section of the paper, we dispel the view that these differences are « new » to the French labour market, and trace back their origin to the sixties. Unbelievable as it may seem, it was already the case that a French unemployed worker had to wait more than eight months before he could get a job in the late sixties, although, at the time, the unemployment rate was only at 2.5%. As we attempt to show, the rise of the French unemployment rate

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<sup>2</sup> For a conventional account of the causes of European unemployment, see the OECD (1995).

from half the US value to twice its level, can be simply analysed as the outcome of a lower growth rate (marking the end of the Golden age) upon a given set of institutions.

We also examine the job patterns of other workers. We argue that difference regarding unemployment rates of female workers is likely to result from measurement errors; we dispel the view that young French workers find it more difficult to find a job than the middle aged workers, and we show that their higher unemployment rate originate from higher separation rates, presumably due to lower firing costs. Finally, we show that the category of workers who suffer the most are the French « old » workers, and that this is likely to result from the pre-retirement system.

The rest of the paper proceeds in three steps. We shall first investigate the key differences between French and US labour markets; we then ask whether the differences can be imputed to the behaviour of the unemployed workers themselves; we finally investigate why unemployment quadrupled in France while it remained essentially flat in the US over the last thirty years. A conclusion summarises our findings.

## 2. UNEMPLOYMENT AND LABOUR MARKET FLOWS

### 2.1. Rates of unemployment

As a starter to the analysis, we compare unemployment rates across the two countries. To perform our cross Atlantic comparison, we have been using different individual data sources. For France, we used the French "Enquête Emploi", collected by INSEE. It consists in a yearly labor force survey that covers 1/300 of the French population. Retrospective questions about month-by-month employment status, during the preceding year are part of the questionnaire which makes it possible to analyze labor market transitions. Furthermore, the survey has a panel structure that makes it possible to keep track of an individual during three consecutive years. Those data have been used for both the analysis of duration and that of wage adjustments. For the US we used two different sources : the Current Population Survey (CPS) and the Panel Study of Income Dynamics (PSID). The CPS is the basic US labor force survey. Unlike the "Enquête Emploi", this first survey is conducted on a monthly basis. By merging different waves of the CPS and making use of the panel structure of the survey, we have been able to compute both monthly and yearly transition rates for the US economy. As far as wage adjustment is concerned we used the PSID data set. This survey consists in a panel of around 7 000 households that has been going on since 1968. It gives longitudinal information about wages and employment status on a yearly basis. In this study, we have been using the years 1988 through 1992.

We have split the labour force into various categories of age, sex and education level. Beyond the sex differential, we split the labour force into three age categories : 20 to 24, 25 to 49, and 50 to 64 years old (thinner decomposition would give similar results). The core age group is composed of workers aged 25-49 years that represent 70% of the French labour force, and 65% of US workers. We then split each of these categories into 4 educational levels<sup>3</sup>. Reported figures correspond to 1989 in the US and 1990 in France, a

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<sup>3</sup> *Low* education corresponds to workers with no diplomas in France and to high school drop outs in the US. *Medium* education corresponds to workers who have not reached the "Baccalaureat" in France and to workers who have finished high school in the US. *High* education corresponds to workers who only have the baccalaureat in France and to College drop out in the US. *Very high* education consists of French workers above two years after baccalaureat and to bachelor's degree or any higher degree in the US. See in appendix 2 the weight of each category in each country's labor force. The French educational system is traditionally

business cycle peak in both cases. At that time, the French aggregate unemployment rate was about twice the US number: 10.2% in France against 5.5% in the US. The results are shown in table 1.

**Table 1: Unemployment rates**

| Age                | Education | Male   |      | Female |      |
|--------------------|-----------|--------|------|--------|------|
|                    |           | France | US   | France | US   |
| 16 to 24 years old | Very High | 8.0    | 3.3  | 7.5    | 2.4  |
|                    | High      | 15.7   | 6.6  | 15.6   | 5.6  |
|                    | Medium    | 14.0   | 10.3 | 24.6   | 11.1 |
|                    | Low       | 27.8   | 17.4 | 39.6   | 16.4 |
| 25 to 49 years old | Very High | 2.6    | 2.4  | 4.6    | 2.2  |
|                    | High      | 4.7    | 3.7  | 6.8    | 4.1  |
|                    | Medium    | 5.4    | 5.9  | 10.9   | 4.6  |
|                    | Low       | 10.8   | 10.8 | 16.7   | 10.4 |
| 50 to 64 years old | Very High | 4.0    | 1.9  | 2.9    | 1.1  |
|                    | High      | 5.6    | 1.7  | 7.3    | 2.7  |
|                    | Medium    | 6.1    | 3.9  | 11.0   | 2.6  |
|                    | Low       | 11.1   | 6.6  | 14.3   | 4.0  |

The first striking feature that emerges from this table is the outstanding similarity of the male 25-49 category. It is especially fascinating to note that the unemployment rate of the low skilled works is exactly at the same level (10.8%) in each country and that this is also essentially the case for very high skilled workers (2.6% in France and 2.4% in the US). Although the numbers appear to be higher for the French women of the same age, this is in part a reflection of the difference in the registration of workers as out of the labour force or unemployed workers. As the following table indeed shows, the similarity of profiles for the core 25-49 years is striking for males *and* females when looking at non-employment rates (which includes unemployed and out of the labour force workers).

**Table 2: Non-employment rates**

| Age                | Education | Male   |      | Female |      |
|--------------------|-----------|--------|------|--------|------|
|                    |           | France | US   | France | US   |
| 25 to 49 years old | Very High | 5.7    | 5.1  | 18.0   | 18.2 |
|                    | High      | 6.9    | 8.8  | 23.4   | 25.0 |
|                    | Medium    | 6.5    | 11.5 | 29.2   | 29.4 |
|                    | Low       | 14.7   | 24.8 | 48.1   | 53.8 |

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considered as more demanding for any given formal level than the US one, which is compensated by the fact that Americans study longer on average than the French. While there is no obvious way to control for such differences in the true educational content of a year of studies across the Atlantic, we believe that the above decomposition is a reasonable adjustment. It is difficult to believe that the difference is even greater than we assume, and a decomposition closer to formal years of education would only reinforce our results.

We can then take table 2 as an indication that the core group of 25-49 years old workers really face the same prospect of « employability » in France and in the US.

As a simple way to account for the contribution of each group to the aggregate unemployment differential we wrote the following equation:

$$u^{France} - u^{US} = \sum_j u_j^{France} (x_j^{France} - x_j^{US}) + \sum_j x_j^{US} (u_j^{France} - u_j^{US}) \quad (1)$$

$j$  denotes a Sex  $\times$  Age  $\times$  Education cell,  $u_j$  is the unemployment rate of cell  $j$ ,  $x_j$  the share of cell  $j$  in total workforce.

The first term is the "composition effect": even though the unemployment rates might be similar within each worker category, the sheer difference in the composition of the labour market could explain the difference in aggregate rates of unemployment. The second effect measures the contribution of within group differentials to the aggregate discrepancy.

The results come as follows :

**Table 3: Decomposition of total unemployment differential**

| Attributable to:   | Unemployment differential (in percentage points) | Within group Composition effect's contribution (in %) | Within group Rate differential effect's contribution (in %) |
|--------------------|--------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|
| All groups         | 4.7                                              | 20.3                                                  | 79.7                                                        |
| Male               | 1.4                                              | 47.5                                                  | 52.5                                                        |
| Female             | 3.3                                              | 8.9                                                   | 91.1                                                        |
| Male 25 to 49      | 0.8                                              | 104.0                                                 | -4.0                                                        |
| 16 to 24 years old | 0.6                                              | -110.4                                                | 210.4                                                       |
| 25 to 49 years old | 2.8                                              | 46.6                                                  | 53.4                                                        |
| 50 to 64 years old | 1.3                                              | 18.4                                                  | 81.6                                                        |

We see that the bulk of the aggregate unemployment differential originates from a higher female unemployment rate (3.3% out of 4.7%), most of which is spread across all educational levels. Males account for an aggregate differential of 1.4%, half of which is the effect of a composition effect. When focusing on males aged 25-49, the aggregate differential falls to 0.8%, all of which being the outcome of a composition effect rather than a uniform differential across educational groups.

At this stage of our description, we are then led to conclude that French and US labour markets do not look so different when focusing on middle-aged workers. Instead, young and old workers do suffer in France from a much worse employment record.

## 2.2. Entry and exit

Much of the discussion over unemployment is usually focused on the *rates* of unemployment. The number of unemployed is indeed the variable that proxies the best the inefficiencies due to the loss of economic output. Yet, the unemployment rate is far from being a good measure of what is usually implicitly discussed, namely the "fluidity" of the labour market. The point that we want to make here is well known, and we believe largely uncontroversial, yet it certainly deserves some emphasis.

Let us simply consider here an economy in which each job is destroyed with a probability  $s$ , while each worker has a probability  $h$  to find a job (each per unit of time). Take the labour force to be constant, and normalised to unity. The law of motion of unemployment is then simply:

$$du/dt = s(1-u) - h.u;$$

$$\text{ie: } du/dt = (s+h)(\hat{u}-u) \quad (2)$$

$$\text{in which : } \hat{u} = s/(s+h). \quad (3)$$

$\hat{u}$  being the target rate towards which unemployment converges (where nothing  $\hat{u}$  from varying over time). Clearly, the equilibrium unemployment rate hinges only upon the ratio  $s/h$ . Two countries with quite distinct separation and hiring rates may end up with the same unemployment level although the working of the two labour markets might be quite. Let us then look in some details at the differences between separations and job finding rates across the Atlantic. The job loss rates are reported in table 4.

**Table 4: Monthly job loss rate**

| Age                | Education | Male   |       | Female |       |
|--------------------|-----------|--------|-------|--------|-------|
|                    |           | France | US    | France | US    |
| 16 to 24 years old | Very High | 1.25   | 1.28  | 1.63   | 1.94  |
|                    | High      | 2.94   | 8.81  | 2.46   | 6.38  |
|                    | Medium    | 2.49   | 4.41  | 2.31   | 6.99  |
|                    | Low       | 3.24   | 10.87 | 2.99   | 13.78 |
| 25 to 49 years old | Very High | 0.38   | 1.27  | 0.48   | 1.98  |
|                    | High      | 0.49   | 1.56  | 0.53   | 2.80  |
|                    | Medium    | 0.47   | 2.34  | 0.77   | 2.94  |
|                    | Low       | 0.69   | 5.40  | 1.04   | 5.58  |
| 50 to 64 years old | Very High | 0.52   | 1.55  | 0.52   | 1.43  |
|                    | High      | 0.46   | 2.39  | 0.81   | 2.44  |
|                    | Medium    | 0.77   | 2.70  | 0.68   | 3.79  |
|                    | Low       | 1.15   | 3.58  | 0.89   | 6.36  |
| Average            |           | 0.53   | 2.84  | 0.83   | 3.18  |

Several stylised facts emerge from this table. First of all, one sees that the job loss rate is always significantly lower in France than in the US, the average difference being a *ratio of one to five*.

The second key feature is obtained by comparing the core group of male 25-49 years old workers. Here we find that the dispersion of job loss rate is more than twice lower in

France than in the US. While the low educated US workers experience a job loss rate that is four times higher than the very high education group, the corresponding French ratio is only two to one. The third important difference to be noted has to do with the relative importance of prime age males compared to the rest of the labour market. Take medium education as a benchmark level. One finds that US female workers aged 25-49 experience a job loss rate « only » 25% higher than males. The corresponding ratio in France is 60%. One also finds a similar difference with older workers. In the US older workers (post 50 years old) experience a job loss rate that is 15% higher than middle-aged workers, while in France the corresponding number is 60% higher. An even more pronounced difference is observed with young workers. In the US a young worker experience a job loss rate which is *twice* higher than a middle-aged worker. In France the number is *five* times higher!

We can then readily summarise these results. *Within* age groups dispersion of job loss rate is much lower in France than in the US; *between* age groups dispersion is much higher. This picture is readily explained by the institutional features of the French labour market. The system is indeed organised as a two-tiers market based upon two types of contracts: short term contract of one year, renewable once and for which separations are supposed to be easy (CDDs or « contrats à durée déterminée) and long-term contracts with higher costs of job termination (CDI, or « contrats à durée indéterminée). Almost all new entrants (mainly young workers, but also female workers) are hired on short term contracts. They are clearly those who experience the higher separation rates: the French society indeed puts all the burden of « flexibility » upon these workers. Regarding old workers, the difference has another origin: pre-retirement systems allow to fire 55-60 years old workers on more generous terms than young workers: again, it is then not surprising that they should experience a higher separation rate.

Let us then analyse the implication of these systems upon the hiring rates of these categories.

**Table 5: Monthly finding rates**

| Age                | Education | France | US    | France | US    |
|--------------------|-----------|--------|-------|--------|-------|
| 16 to 24 years old | Very High | 9.68   | 40.00 | 21.27  | 50.00 |
|                    | High      | 11.59  | 29.13 | 12.17  | 34.44 |
|                    | Medium    | 10.78  | 33.14 | 9.56   | 24.56 |
|                    | Low       | 8.30   | 26.56 | 7.01   | 24.19 |
| 25 to 49 years old | Very High | 8.15   | 22.43 | 8.37   | 27.16 |
|                    | High      | 6.35   | 28.80 | 6.99   | 24.29 |
|                    | Medium    | 7.84   | 32.03 | 6.82   | 25.72 |
|                    | Low       | 5.26   | 30.00 | 4.17   | 22.13 |
| 50 to 64 years old | Very High | 3.03   | 14.81 | 1.52   |       |
|                    | High      | 0.96   | 25.93 | 2.16   | 23.08 |
|                    | Medium    | 1.66   | 29.67 | 2.00   | 26.00 |
|                    | Low       | 1.05   | 36.67 | 0.65   | 16.22 |
| Average            |           | 5.97   | 29.4  | 4.77   | 23.80 |

The picture that emerges is almost the mirror image of the previous one. First of all, the US picture is readily described: there is almost no dispersion of the hiring rate across

each category. Take male workers first. The discrepancy is at most of 10% across ages and skills. Meanwhile, female workers are 30% less often hired, but again the difference is fairly uniform across age and skills. The only « anomaly » is the job finding rate of very highly educated US worker which is half the other rates.

Let us now look at the French rates. Start with 25 to 49 years old workers. While their separation rate was shown above to be more compressed across the skill ladder than in the US, one now finds the opposite result with respect to the hiring rate: the job finding rate of low educated male worker is 50% below that of the very-highly educated one. The corresponding ratio is also very large for low and very highly educated female workers, at a level of two to one. Let us now analyse the hiring pattern of young workers. Start with workers with a medium education. One gets that the hiring rate of young French workers is 40% *higher* than that of middle age workers both for male and female workers. Nevertheless, among the younger workers, there is little dispersion across skills in the level of the hiring rates except (as in the US) for the very highly educated female workers. This is probably the other effect of the CDD system: low firing costs raises younger workers' separation rates, but also increase their hiring rates. Finally, let us investigate old workers. While high separations are associated with high hiring rates for the young workers, we find here a negative correlation: French workers aged 50-64 experience a hiring rate that is 80% lower than the middle age group, while the corresponding ratio is 20% in the US. This may either mean that they turn down jobs more often because pre-retirement schemes are more attractive, or simply that the old workers who lose their jobs are not wanted in France because, say, they are too expensive. As the next section will show, this is the latter explanation that is valid.

As a simple way to summarise the hiring and the separation rates tables, we have represented on the same diagram the scattered plot of the relative hiring rates (French divided by US numbers) to the relative separation rates. The 45° degree line corresponds to the locus where unemployment rates should be equal in the long run (if it was not for exogenous demographic factors).

[Picture 1 about here]

The picture clearly highlights the results that we obtained so far. Except for the old workers who suffer from a low hiring rate, the remainder of the population is more or less around the 45° degree line: higher separation rates are associated with higher hiring rates.

This section then points to the influence of French legislation upon the patterns of entry and exit of French workers. It might be interesting to point out that legislation need not be the only explanation. Take the instance of young French workers. The CDD system makes it basically costless to fire them if needed. Yet this separation rate is still 50% lower than then American counterpart. In our view, this difference might reflect « irreducible » cultural differences across the Atlantic with respect to employment termination, or to put it differently perhaps is it part of an "implicit contract" of a different kind that makes it uneasy for a firm to fire a worker (see d'Iribarne, 1992), whereas the greater differences found for the middle aged arise from the cumulated effect of culture and regulation.

### 3. WAGE LOSS OF DISPLACED WORKERS

While for a large part of the labour market, unemployment rates do not appear to be much different across the Atlantic, the major point to be explained is the large difference in

the duration of unemployment. Let us then proceed to address the following issue: can one gather evidences that low hiring rates in France originate from the fact that French unemployed workers are led to turn down job offers more often than their American counterparts? Our method to investigate whether French workers are « choosier » than their American counterparts will be to focus on the pattern of wage of formerly displaced workers

### 3.1. Reservation wage: A theoretical benchmark

A possible explanation for the length of French unemployment could be that unemployed workers set reservation wages that are too high to allow for a high rate of job finding. This explanation actually underlies the views that put forward the role of unemployment benefits and minimum wage. Yet the measurement of this wage rigidity is an open issue. What is the appropriate benchmark through which we should gauge the strength of these forces? And given such benchmark, which group of French workers appear to be binding on institutional differences? Such are the questions that we now want to address.

As a starter to the analysis, assume that the distribution of wages of a given group of workers (Age  $\times$  Education  $\times$  skills...) is an interval  $[w(1-\sigma), w(1+\sigma)]$ . All workers within that cell are assumed to have the same intrinsic characteristics, the differences in wages being only a reflection of idiosyncrasies of the firms that they are matched to. Assume now that a worker who is displaced from his initial work suffers from a human capital loss that shifts the range of jobs that he has access to from the initial interval into another one  $[w(1-k)(1-\sigma), w(1-k)(1+\sigma)]$ . If the worker is simply randomly matched from the previous interval to the lower one, the average discount that the worker would experience in average is clearly  $kw$ , that will measure the human capital loss of the worker.

Let us now assume that the shift from the first distribution to the second one is constrained by minimum wage regulations. So let us assume that the lower interval that the worker has access to is only an interval  $[w^*, w(1-k)(1+\sigma)]$ , in which, say,  $w(1-k)(1-\sigma) < w^*$ . In that case, the discount that the worker will have access to will be narrowed down (involuntarily) to be worth, in average:

$$\Delta(w^*) = \{kw - [w^* - w(1-k)(1-\sigma)]/2\} \quad (4)$$

Clearly, the higher will the minimum wage regulation be, the lower the discount. If such was the only story in force, one should then expect the discount of displaced workers to be lower for those workers who are potentially binding on minimum wage regulation.

Minimum wage regulations, however, are not the only force at work when a worker is experiencing a work displacement. Perfect "flexibility" of wages does not mean that they take "any" value that is consistent, say, with zero unemployment. The discount will also be subject to an explicit trade-off on the side of the worker himself: should he take "any job" that he gets acquainted to, or will he set a "regulation" of his own that will reduce, voluntarily this time, the spectrum of wages that he has access to? This question has been extensively addressed in the literature and is known as the "reservation wage" issue. Let us briefly summarise its result and adapt it to account for the huge dissimilarities that we observed between French and American separation and hiring rates.

First the reservation wage depends upon unemployment benefits: the higher the replacement ratio, the higher the reservation wage (and the lower the exit out of unemployment).

Second it also depends upon the arrival rate of new offers. When hiring rates are low, then the worker will clearly be less demanding and the reservation wage should be low.

Third, the reservation wage will also depend upon the life time wage profile that his acceptance will imply. If he expects that the job that is offered will not last long then the wage will not carry too much implications and the reservation wage will be low. If instead the job that is offered is, say, a life long job, then we should expect the worker to be more demanding.

In the simulation of the canonical model that we offer in appendix, we find that the parameters of the French and American economies would actually imply a similar reservation wage  $w^*$ , hence a similar discount  $\Delta(w^*)$ . There are various counter-acting effects that explain this similar number. First, while higher hiring rates make Americans choosier, higher firing rates go in the opposite direction. Because of time preference, the net effect is to bid up reservation wages in the US with respect to France because hiring takes place before termination. Second, higher unemployment benefits in France makes the French choosier, everything else equal. Third, higher wage dispersion in the US. makes Americans choosier (it is worthwhile searching more when the world has wider opportunities). The net of these three effects is, in our calibrated model, a wage discount of about 9-10% in both countries between the wage distribution of new hires and the aggregate wage distribution. Let us now put these ideas to the test of measuring the discount of displaced workers.

### 3.2. Discount

We study empirically the wage experience of unemployed workers. For this, we study the wage differential between employed workers who have recently experienced an unemployment spell and those who have not. Following previous work by Ruhm, we focus here on displaced workers, i.e. workers who experienced an unemployment spell because of the fact that they lost their job for a set of exogenous circumstances such as the closure of their firm, the bankruptcy of their employer or other laid off circumstances not having to do with the worker's behaviour (such as "poor work performance, disciplinary problem or any other problem that is specific to that individual alone", for which the CPS classification deals with "fired" workers"). In France such category corresponds to "licenciements économiques + fin de CDD + fin de stage ou d'interim". We then exclude from our sample the new entrants and the fired workers (we nevertheless report below results in which these categories are included).

To estimate the wage discount of previously unemployed workers we run the following basic equation :

$$Y_i = \alpha_i X_i + \beta \cdot D_i + u_i$$

where  $y_i$  denotes the log of individual  $i$ 's hourly earnings,  $X_i$  is a set of variables that control for individual characteristics (age and its squared, educational level, sex, state of residence), and  $D_i$  is a dummy variable that is equal to one if individual  $i$  was displaced at any point during the two years preceding the survey (we also control separately for workers who quitted their jobs).

Running this equation with OLS gives our basic estimate of the aggregate wage loss of previously unemployed workers. Yet as pointed out very often in the US literature, these estimates will be biased as long as the individual idiosyncratic term  $u_i$  is correlated with the

previous unemployment experience dummy  $D_i$  (e.g. if worse workers are fired first the wage loss might simply signal the poor ex-ante worker's quality). To correct for this bias we also included the lagged value of individual  $i$ 's wage in the equation, which captures the individual idiosyncrasies that might be correlated to the dummy  $D_i$ . We also report the results that are obtained when controlling for the quartile of the past wage that the worker belonged to, or when interacting the unemployment dummy with the age, sex and education characteristics of the worker.

The overall results are presented in table 6 below, where age categories have been split into two education categories: low and high diplomas, corresponding in France to above or below baccalaureat, and in the US to a college degree.

**Table 6: Wage discount for displaced workers, controlling for tenure and wages at previous job**

| Worker category                | France           | US               | Worker category          | France           | US               |
|--------------------------------|------------------|------------------|--------------------------|------------------|------------------|
| All workers                    | -0.118<br>(7.37) | -0.089<br>(4.59) | 16-24.<br>low education  | -0.076<br>(1.86) | -0.046<br>(0.55) |
| Bottom quartile                | -0.120<br>(5.04) | -0.100<br>(2.90) | 16-24.<br>high education | -0.166<br>(1.29) | -0.075<br>(0.59) |
| Males 25-49,<br>low education  | -0.142<br>(5.41) | -0.117<br>(3.00) | 50-65.<br>low education  | 0.021<br>(0.34)  | 0.0098<br>(0.39) |
| Males 25-49,<br>high education | -0.098<br>(1.32) | -0.054<br>(1.26) | 50-65.<br>high education | -0.368<br>(2.22) | -0.028<br>(0.55) |

Our estimates for US. wage discount are in line with those found in the literature on US data, notably Ruhm (1991) and Jacobson et. al (1993)<sup>4</sup>. On this side of the Atlantic, Bacache et al. (1995) find results similar to ours. As one sees, the French numbers are typically larger than the American ones. To the least, one cannot point to the conclusion that

French displaced workers have a higher reservation wage than their American counterpart. Furthermore, the discount fits the simulation that is presented in appendix 1.

As a way of testing more specifically the potential role of the minimum wage regulation, we have ran the same regression for the lowest quartile only. The idea is to test the extent to which the optimal reservation wage formula that is spelled out above is constrained by the minimum wage. As is evident from table 6, the French discount remains higher by 2 percentage point than the American one (while it was 3 percentage point higher for the workers as a whole). Whatever the role of the minimum wage might be, it does not appear to be a way of forcing (or helping) the French displaced workers to bid up their wage above their American counterpart.

Is there then any specific group for which minimum or reservation wages constraints are more binding in France than in the US.? The "core" group of unskilled men aged 25-49 suffers from a higher discount in both countries, which is consistent with their higher attachment to the workforce. But the difference between the two countries is unaffected

<sup>4</sup> Beside these aggregate numbers, Carrington (1993) also finds evidence of a higher wage cut for more educated and more experienced groups, which we also find.

when one limits oneself to this group, with French workers experiencing a wage loss 3 points larger than their American counterparts. On the other hand, for skilled men, the discount is smaller and insignificant -which may have to do with their higher exit probability, in accordance with the above model- but remains substantially higher in France than in the US.

As for uneducated youth, they might well suffer from the minimum wage, as their discount is smaller than average and statistically insignificant. However, this is even more true in the US. than in France: the discount remains smaller for this group on the other side of the Atlantic. The same is true for skilled youth.

Similarly, the unskilled older workers experience no significant discount either in the US or in France. The high education group instead, does experience a very large discount in France, and an insignificant one in the US. This is in line with the view that the demand for these workers is much lower in France (cf. their low hiring rate displayed in the previous section). One possible interpretation is that these workers' skills have been devalued by industrial restructuring, so that they were unable to find another job corresponding to their skills.

By controlling for the wage held in the previous job, we automatically exclude new entrants from the sample. New entrants, however, may suffer more from minimum wage regulation if their employers require a higher discount than for other workers, say for screening and/or training reasons. On the other hand, new entrants have no access to unemployment benefits, so that we expect the discount to be lower in France than in the US. only for those new entrants who are close to the minimum wage.

To include new entrants into the sample, we therefore ran a more naive regression in which the discount of a workers who experienced an unemployment cell is measured, when the regression is conditioned upon the same characteristics as before, except for the past wage which is not available for new entrants. The results, reported in Table 7, are somewhat in line with our priors. The wage discount remains higher in France than in the US. -including for bottom quartile workers-, with the exception of the least skilled youth, for which it is five points below the US. level. Given the similarity of the discount among displaced workers, such a discrepancy rests on young new entrants, whose first wage then appears to be relatively lower in the US. These workers are presumably those for whom the minimum wage regulation is binding.

**Table 7: Wage discount for previously unemployed workers**

| Worker category                | France            | US                |
|--------------------------------|-------------------|-------------------|
| All workers                    | 0.192<br>(25.36)  | -0.159<br>(15.10) |
| Bottom quartile                | -0.134<br>(11.65) | -0.130<br>(7.27)  |
| Males 25-49,<br>low education  | -0.068<br>(3.32)  | -0.120<br>(2.50)  |
| Males 25-49,<br>high education | -0.265<br>(4.20)  | -0.267<br>(2.44)  |

We can summarise our findings as follows:

*. In both France and the US, displaced workers experience a wage loss of about 10 percent relative to otherwise equivalent workers.*

*. For the main age group, the discounts are very similar in France and in the US*

*. The discount is smaller in France than in the US. for the least educated new entrants.*

*. The discount is much higher for skilled older workers in France than in the US*

We are then led to the following conclusion. The fact that the wage discounts across the two countries are fairly identical can be taken as a confirmation of the very first naive model that we presented in the previous section: the discount simply reflects the loss of specific skills or of human capital that is attached to a displaced worker. To the very least, this implies that minimum wage regulations are not relatively more important in one country than in another when it comes to analyse the re-entry of displaced workers into the job market. If, say, we expected low skilled displaced workers to be binding on minimum wages in France, then surely there could be no discount observed as they switch from one job to another. Building upon the more sophisticated model that we spell out in appendix 1, one can alternatively argue that many competing forces are at work in the determination of the equilibrium reservation wage, which neutralise each other because of the opposite influence of the hiring and separation rates.

Whichever interpretation is valid, however, one is left with the following results. If one decomposes the actual hiring rates  $h$  as the product of the potential job offer rate times the acceptance rate of worker, one must conclude that the difference between France and the US regarding these rates does not originate from a lower acceptance rate in France, be it the outcome of unemployment benefits or minimum wage regulations. In the simulated model presented in appendix, the rejection rate stands at 35% in France and at 31% in the US.

## **4. Back to macroeconomics: time patterns**

We must conclude from the previous section that the critical differences between French and US labour markets do not stem from the behaviour of the unemployed workers themselves. Where are they originating from? There are implicitly two questions here. One is: why is it that hiring and separations are both so much lower in France than in the US? The second one is: why is it that the ratio of the two has evolved in such a way as to quadruple French unemployment over the past thirty years while keeping the US rate even? Let us try to put some perspectives (rather than definite answers) on each questions.

### **4.1. Theoretical benchmark**

Let us start with the first question: why is it that hiring and separations are so much lower in France than in the US? There are clearly a two way causation at work here. One is to argue that low separations reflect high firing costs whose effects are to lower the hiring

function<sup>5</sup>. According to this reasoning it is low separation that cause low hiring rates. But the other causality can also be at work. If hiring are low for exogenous reasons (say: French firms are run by engineers who prefer machines to workers, or whatever) then separations will also be correspondingly low: French workers will be reluctant to leave their firms, even when they are unhappy; they will also *endogenously* bid up the demand for regulations that will protect them against arbitrary firings. Under such reasoning, it is low hiring that cause low separations. When both causation are at work, the end result is that one may have multiple equilibria: two otherwise similar economies may be stuck at two different regimes: in one low separations and low hirings are set together, while the other economy will experience high flows in and out of unemployment (this is demonstrated theoretically in Saint-Paul, 1996a and 1996b).

Taking such picture as a starting point to differentiate France from the US, the next question is whether there is any presumption that the low separation/low hiring country will experience a higher unemployment rate than the other one. The theoretical answer is negative, and the most simple empirical way to illustrate this is to take the early 1970s as a benchmark. Back in those years, it was already the case that hirings and separations were much lower in France than in the US. *In April 1968 the average length of French unemployed workers uncompleted spell was already at 8.8 months (in March 1973 it stood at 8.6, in March 1993 at 12.9 months)*. Yet, the French unemployment rate was around 2% at the time! This statistic is itself a simple way of seeing that the feature of the French economy was already there back in the sixties. One also sees that low hiring/low separations do not necessarily imply high unemployment.

The next question is then: why has it soared to its current levels? Our suggested answer builds upon the effect of growth on hiring and separations. In order to understand the mechanism at work, let us follow here Pissarides' equilibrium unemployment theory. When hiring a worker is a costly decision, either through the matching process itself, or more broadly, through the training period that a worker has to go through when he finds a new job, hiring a worker becomes a decision that takes the form of an investment. The benefits that the firm draws from a match are the present discounted value of the surplus that it expects to extract from the worker in the future. One critical implication of these costs is that, when the economy is growing, one should then expect that the higher the growth rate, the higher the present value of the surplus generated by the match, hence the higher the hiring rate should be. This is referred by Pissarides as the "capitalisation effect" of higher growth. *Ceteris paribus*, the slow down of growth should lower the hiring decision and raise the unemployment rate. As we now want to show empirically, such is indeed what has happened to the French economy. It has moved from a fast growing path of about 5% a year (the Golden age, during which it was catching up the US economy) to a lower path of about 2%. This lowered the « capitalisation effect » and induced to unemployment rate to pick up.

## 4.2. Labour market flows and growth

Let us put this idea to an empirical test and first attempt to explaining the French hiring rate as a function of growth and of the business cycle. In order to do that, we have Hodrick-Prescott filtered the growth rate of the economy. Call  $g$  such filtered value. Furthermore,

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<sup>5</sup> In theoretical terms, firing costs need not translate into lower hiring rates if the wages are flexible. The intuition is that wages should absorb the expected cost of firing the worker. This is not the case however if firing costs distort the optimal pattern of separations, in which case the hiring function will be lowered.

we have accounted for the business cycle, by also controlling for the rate of capacity utilisation Gap, as measured by the OECD. The raw results come as follows:

*US hiring rates:*

$$\text{Log } h = +1.3 + 12.7 g + 0.05 \text{ Gap}$$

(5.4)      (6.7)

$$R^2 = 0.74; DW = 1.8$$

Sample: 1964-1991

t statistic in parenthesis.

*French hiring rates*

$$\text{Log } h = -1.4 + 14.6 g + 0.04 \text{ Gap}$$

(6.3)      (2.7)

$$R^2 = 0.80; DW = 1.02$$

Sample: 1971-91

t-statistics in parenthesis

These regressions unambiguously points to the dominance of the "capitalisation effect". Slow growth reduces the hiring function. The surprising feature is how similar the coefficients of the regression are alike, both with respect to growth and with respect to business cycle. The US regression appears to be quite robust to introducing lags, time dummies and trends. The French regression is not as good (especially regarding its low DW); a time dummy for 1974-84 (d74-84) corrects for it; one then gets the following results:

*French hiring rate*

$$\text{log } h = -1.46 + 16.0 g + 0.035 \text{ gap} + 0.12 \text{ d74-84}$$

(9.3)      (3.0)      (4.2)

$$R^2 = 0.91; DW = 2.1$$

Sample: 1971-91

t-statistics in parenthesis

The surprising feature is now that the hiring rate was *increased* during the years 1973-84, a result that is already commented in Burda and Wyplosz (1994), and which might be interpreted as the response of the labour market to the increase of the number of unemployed.

Let us now turn to the separation rate. In their critique of Pissarides' model, Aghion and Howitt (1994) have forcefully argued that "creative destruction" of modern economic growth might positively correlate growth with separation rates, hence making the net effect of growth on unemployment ambiguous. Let us then analyse here the correlation between separation rates and economic growth. To capture the effects of growth, we have used the same determinants as those that we used for analysing the hiring function. We first get the following raw results:

*US separation rates:*

$$\text{Log } s = -0.7 - 15.0 g - 0.04 \text{ Gap}$$

(-5.2)      (-4.4)

$$R^2 = 0.64; DW = 1.3$$

sample period : 1964-1991  
t statistics in parenthesis.

*French separation rates*

$$\text{Log } s = + 2.2 - 15.9 g - 0.004 \text{ Gap}$$

(-5.2)    (-4.4)

$$R^2 = 0.64; DW = 0.3$$

sample period : 1964-1991  
t statistics in parenthesis.

The separation rate therefore appears to be well explained by the deceleration of growth which took place around the mid-seventies, and by the business cycle (such as measured by capacity utilisation). It fits the Mortensen-Pissarides framework where high growth makes it worthwhile to retrain the workers in response to a technology shock but the correlation goes in a way that is opposite to what Aghion and Howitt have predicted: low growth *raises* separation rates. Once more, the raw results display a striking similarity between the US and France regarding the elasticity of separation to growth. Instead the impact of business cycles fluctuations upon separation are ten times less important in France than in the US, which is illustrative of the view that transitory disturbances do not trigger separations in France, which itself might be viewed as the outcome of an implicit contract between firms and workers across the cycle.

Both equations can be improved. In the case of France, a dummy for the oil shock does reveal an increase in the number of separations, while the US variable appears to be serially correlated. After such corrections we obtain the following results:

*US separation rates:*

$$\log s = -0.24 - 7.6 g - 0.02 \text{ Gap} + 0.58 \text{ Log } s(-1)$$

(-3.4)    (-4.0)    (6.1)

$$R^2 = 0.85; DW = 1.3$$

sample period : 1964-1991  
t statistics in parenthesis.

As one sees, the regression has no effect to the long run value of the elasticities involved. Regarding France, one now gets:

*French separation rates:*

$$\text{Log } s = 2.3 - 16.3 g - 0.0 \text{ Gap} - 0.07 d74-84$$

(-8.9)    (0.0)    (-2.7)

$$R^2 = 0.85; DW = 1.8$$

sample period : 1971-1991  
t statistics in parenthesis.

In this regression, the business cycle variable Gap becomes totally nil, confirming the critical difference between France and the US on this matter. One also sees the increase in separation during the oil shocks years, showing that French workers were « hoarded » during that period.

#### 4.4. Transition dynamics

If one tries to estimate the impact of a reduction of growth upon unemployment, one obtains an equation such as:

$$\Delta u/u = (1-u) [\Delta s/s - \Delta h/h]$$

Say that the US economy were to experience a slow down of growth of 3 percentage points (such as one experienced in France after the end of the golden age), this would generate an increase of the unemployment rate of 80 percent, bringing the economy from 5% to 9%. Using the two regressions to calculate the French structural rate of unemployment, one can decompose the current level of unemployment between the contribution of the "cycle" and the effect of a permanently lower rate of growth. The model implies a natural rate of about 10%, 2.5% below the 1997 rate, which is also what is found in Cotis et al. (1996). From such perspective, one can easily analyse the dynamics of French unemployment over the years as the outcome of the response of the separation and hiring rates to the slowdown of growth (marking the end of the Golden Age). More specifically, we can decompose the effect of lower growth into two components that follows equation (3): one component that shows the effect of the shift of hiring and separation rates on the target unemployment rates  $\hat{u}$ , the other one that corresponds to the convergence of the unemployment rates towards the new target. One can then readily follow the track record of French unemployment rate as the joint movement of  $\hat{u}$  and the convergence of the unemployment rate itself to its moving target. This is depicted in picture 2.

[Picture 2 about here]

As one sees, the target rate actually starts declining in the eighties, but this was not visible to the observer as the current unemployment rate itself kept rising to catch up with its higher target. To put it simply, there was one major shift of the target rate from a low level in the sixties to a higher level in the eighties, but to the observers of the time, this appeared as a continuous upward rise, that seemed to be never-ending.

By comparison, as picture 3 shows, the US show no significant discrepancy between the target rate and the actual unemployment itself.

[Picture 3 about here]

Although the impact of the slowdown of growth on the unemployment rates are actually about the same as the French ones, the magnitude of the shifts in the growth rates has been much smaller.

## 5. Implications

### 5.1. Summary of the argument

Let us now briefly summarise the key picture that emerges from our analysis.

We may think of labour market institutions as of being of two types. The first type has to do with the determination of the reservation wage of workers. Unemployment benefits, minimum wage regulations are such kind of institutions that induces the worker to pick up too low a discount, and to wait longer that he would have wanted otherwise (in a different institutional setting). For a given (potential) job offer rate, they shift the acceptance rate of workers and the hiring outcome. The results that we obtained comes as

follows. For the low skilled/young workers, there are indeed some evidence of such binding constraints. For the remainder of the population, however, we found no such evidence. This might be for two reasons. One is that minimum wage regulation are sometimes avoided (it is reported that up to 5% of the French work force earns less than the minimum wage). The other one is that in the US as in France, supply (rather than demand) considerations are at work. At any rate, there are no indications of a lower acceptance rate in France.

The second aspect has to do with regulations that influence the decision process *after* the worker has been hired. Here we are discussing the set of institutions that shift the bargaining power of the workers, those that enable them to extract a rent: firing and hiring costs, the role of unions, or (again) the minimum wage laws which put a lower bound to the outcome of the wage determination process. One manner to evaluate these institutional differences across the Atlantic is to analyse the pattern of separations. From the tables that we displayed in section 2, we are led to conclude on the importance of the set of legislation regarding firing costs. We also pointed out however that legislation need not be the only mechanism at work. They are not exclusive of a broader set of explanations: either through a different kind of implicit contract regarding the tenure at a job, or through a reverse causality argument out of which it is the low hiring rate itself that generates a demand for increased protection. At any rate, the time series evidences point to the fact that the low hiring/low separation picture was antecedent to the unemployment crisis, but was exacerbated by the slow down of growth.

## 5.2. Policy implications

Our findings can help evaluate the relevance of many policy measures that are advocated as a cure for unemployment in France.

It is often argued that the young should deserve special attention because they have a particularly high unemployment rate. This is part, in our view, of much of an hypocrisy. Short term contracts have been implemented in France as a way to respond to the demand of "flexibility" of the economy, while protecting middle-aged workers. The key to the youth unemployment problem is not that they suffer from high employment duration (their hiring rate is *relatively* higher than in the US); it is due to the fact that they suffer from a much higher separation rate. They are part of the dual labour market that French regulation has wanted.

Instead, our analysis reveals that there is one French category that suffers more than their American counterpart: it is that of the "old" (post 50) workers where the hiring rates are up to thirty times lower than the US level (for the least educated group). Although they are less visible (because their numbers are lower), they form the group which is the most badly hurt by the system.

Another common view is that hiring subsidies should be targeted to low wage labour, which suffers more from insititutional barriers than high wage labour. Again, our analysis casts doubt over this view: middle-aged low skill workers do not appear to suffer more from unemployment than their American counterpart. We suggest that a more precise targeting is needed towards young unskilled workers.

In terms of which institutions are most harmful and should consequently be removed, we found that firing costs seem to depress the demand for labour. In part these firing costs might represent a defensive move against low hiring, especially for uneducated labour. From this perspective the temptation to reduce unemployment benefits in order to raise the incentive to find a job would not go in the right direction: it would strengthen these pressures, and we found no clear evidences of their perverse effects. Instead, one could

lower the severance payments to the workers and seek to offset these reductions by an equivalent (in terms of present discounted value) *increase* in unemployment benefits.

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## APPENDIX 1: Reservation wage in theory and practice

Let us briefly spell out here how the literature has modelled the trade-off between search and wage. We follow here the version that is offered in Sargent (Ch.2, sect.2.8) appropriately amended to account for hiring rates and separation rates. Assume that each unemployed worker is offered new jobs, according to a random matching process, where each job carries a wage  $w$  drawn from a wage distribution. The worker may either accept a particular offer or turn it down and look for a better paid job. As is shown in the literature on the topic, the strategy of the worker amounts to selecting a *reservation wage*  $w^*$  below which he will turn down all wage offers and above which he will accept them all. The determination of  $w^*$  will depend upon a few key parameters that we now examine.

Assume that a worker who is looking for a job receives job opportunities at a rate of  $\lambda$  jobs per unit of time. Each job is associated to a wage offer which might vary across firms. Call  $F(w)$  the cumulative distribution of wage across job offers. The equilibrium value of the reservation wage  $w^*$  will be the outcome of two competitive evaluations. On the one hand, accepting a wage offer  $w$  immediately ends the quest and raise the current level of revenue that the worker receives. Call  $c$  the unemployment benefits received by the worker, the current gain is then simply  $w - c$ . On the other hand, accepting a wage  $w$  forecloses other opportunities that could be offered in the future. Those opportunities, when they are flowing, would yield an additional income worth  $w^* \int_0^\infty (w - w^*) dF(w)$  on every period during which the job is likely to be kept by the worker. So the present value of those potential gains must be weighted by a discount factor. Call  $\delta$  the rate of time preference of the worker and  $s$  the separation rate at which a job is ended, one must then weight the preceding integral by  $1/(\delta + s)$ . But these gains must themselves be weighted by a number which corresponds to the likelihood that such an offer will indeed be channelled to the worker, that is by the job offer rate  $\lambda$ . Bringing these features together, one gets that the equilibrium reservation wage  $w^*$  will be a solution to :

$$w^* - c = (\lambda/\delta + s) w^* \int_0^\infty (w - w^*) dF(w) \quad (A1)$$

in which, to repeat,  $\lambda$  and  $s$  stand for the (say, monthly) offer and separation rate, and  $\delta$  stands for the rate of time preference. The left-hand side is an increasing function of  $w^*$  while the right-hand one is a decreasing function, so that there is a unique equilibrium. If one neglects for the time being the role of  $c$ , unemployment benefits, and of  $\delta$  the time preference parameter, one gets that the reservation level  $w^*$  is only a function of  $\lambda$  which is the ratio of the job offer rate to the job separation rate. Two countries such as France and the US with similar  $\lambda$  ratios would then deliver identical reservation wages. The intuition is simply the following. French workers should accept lower wages when they are offered one because those offers are rare (compared to the US). On the other hand, because they are likely to keep the job longer, French workers are also more demanding: they do not want to get stuck with a low wage forever. Such is not the concern of a US worker who can simultaneously afford to reject a bad job because other offers will be forthcoming, but who do not mind either because it will not last anyway...

When unemployment benefits and time preferences are plugged to the analysis, two additional effects tilt the picture. Higher unemployment benefit (as in France) raise the French reservation level (it is less costly to wait). On the other hand, taking account of time preference will lower the reservation level of the country in which the job offer rate is

the lowest: in average one has to wait longer before another offer is made and although the next offer will last longer this tilts the decision towards accepting more often a job. Bringing these two pieces together, one gets an ambiguous result: depending on the relative strength of the time preference factor relatively to the unemployment benefit factor, wages could be more "flexible" in either country.

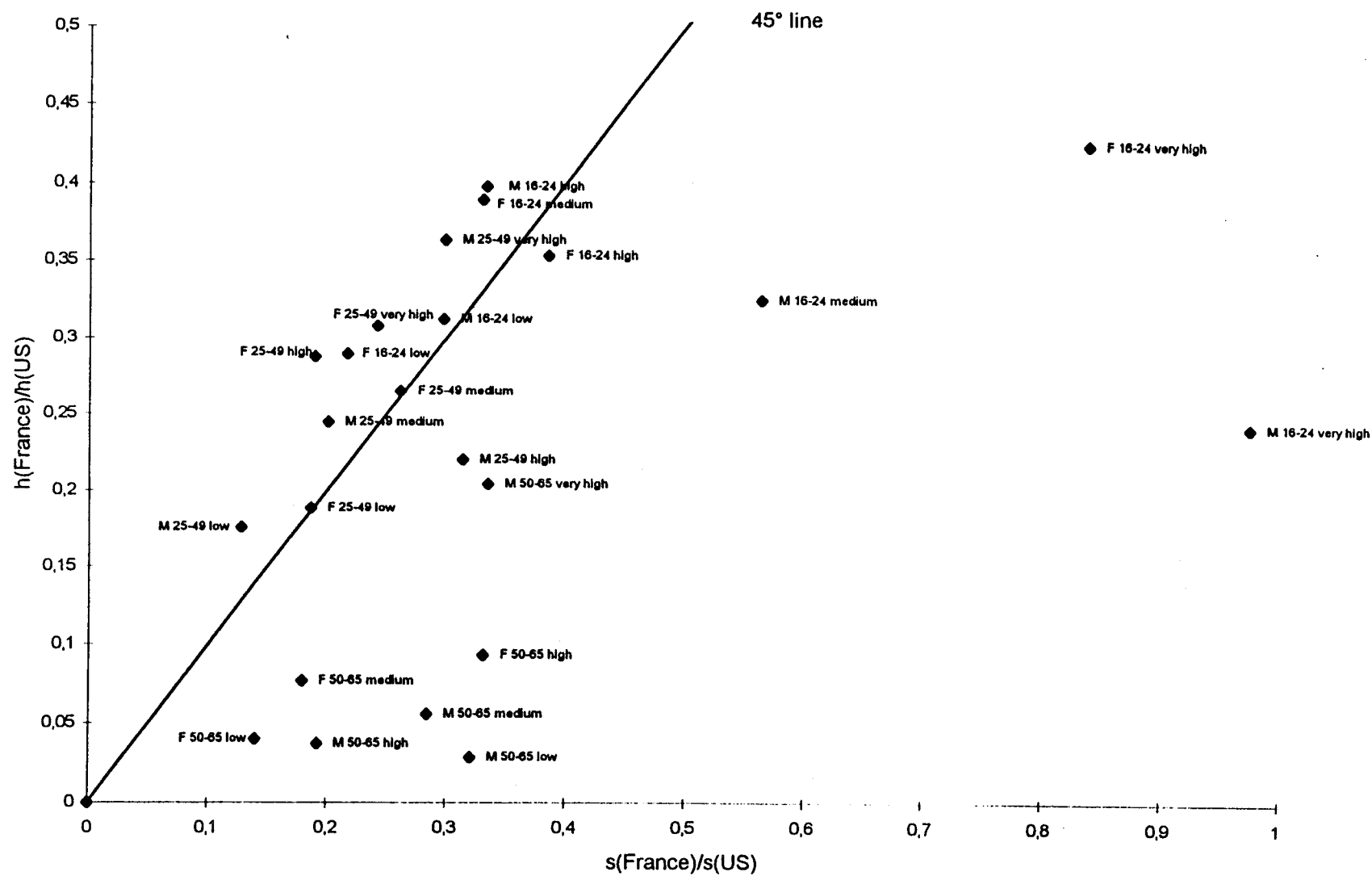
We can expand this simple model in one direction: job promotion. When workers take an offer, this is not the end of the story: they may keep climbing up the pay ladder. In order to model this process, we follow Lefranc (1997) and assume that once unemployed workers have accepted an offer, they can get another offer, drawn from the same distribution, with the same arrival rate  $h$ . For simplicity we assume they accept this offer if and only if it pays more than their existing wage. Once they have done so they won't get any other offer, unless they become unemployed, in which case their search process starts again. It is such simple model that we have calibrated.

With  $r=0.05$ , and  $c=0.6$ ,  $\sigma =0.5$ ,  $h=0.6$ ,  $s=0.075$  for France, we get a wage discount of -9.05%. For the U.S., with  $c=0.25$ ,  $\sigma =0.7$ ,  $h=3.2$ ,  $s=0.36$ , the implied discount is -9.43%. Note that the discount would be reduced to -7.97% in the US if it had the same unemployment benefit level as France, while it would increase to -11.3% if the US has the same hiring and separation rates as France. Thus we see that the similar discounts are the outcome of offsetting effects. Note also that the model matches well the order of magnitude of the discount implied by our estimates, i.e.  $\approx 10\%$ .

**APPENDIX 2:**  
**Composition of total labor force by age and education**  
**(Table A2 here)**

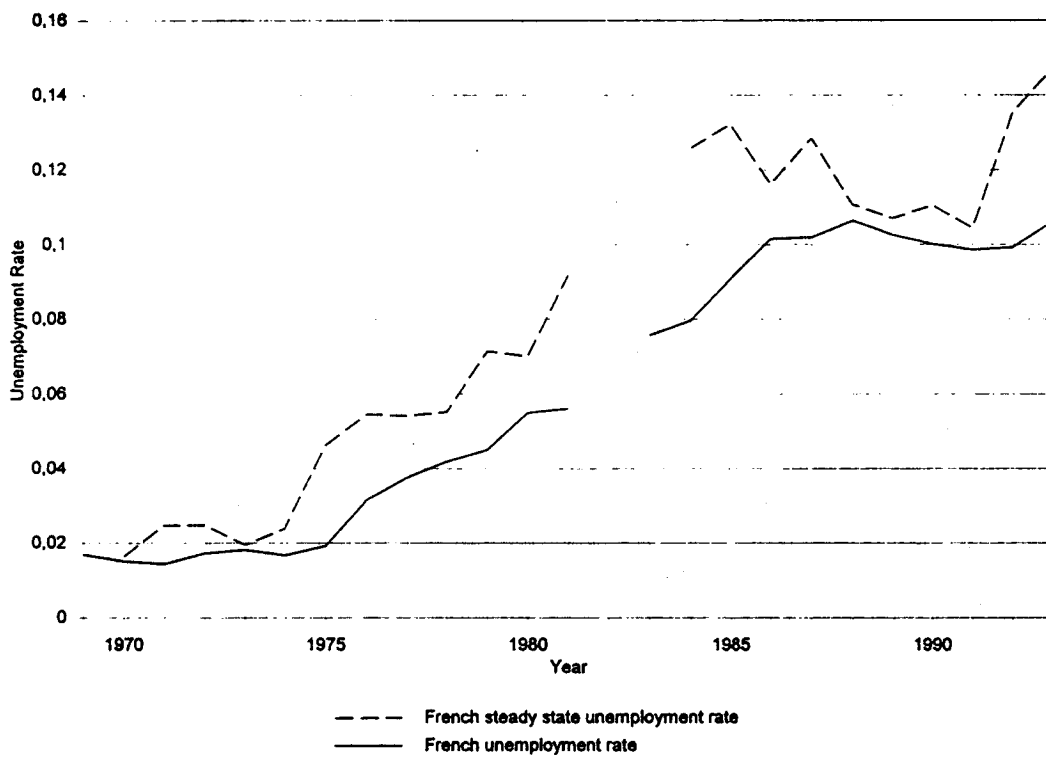
| Composition of total labor force by<br>age and education |        |      |                                                         |        |      |
|----------------------------------------------------------|--------|------|---------------------------------------------------------|--------|------|
| Share of total labor force (in %)                        |        |      | Educational composition (in %<br>of group's population) |        |      |
| Age group:                                               | France | US   |                                                         | France | US   |
| All                                                      |        |      | Very High                                               | 15.7   | 23.0 |
|                                                          |        |      | High                                                    | 10.3   | 24.2 |
|                                                          |        |      | Medium                                                  | 37.9   | 35.9 |
|                                                          |        |      | Low                                                     | 35.9   | 16.7 |
| 16 to 24<br>years old                                    | 10.9   | 17.9 | Very High                                               | 7.4    | 7.7  |
|                                                          |        |      | High                                                    | 10.1   | 31.4 |
|                                                          |        |      | Medium                                                  | 49.9   | 31.7 |
|                                                          |        |      | Low                                                     | 32.5   | 29.2 |
| 25 to 49<br>years old                                    | 70.3   | 64.7 | Very High                                               | 18.5   | 27.7 |
|                                                          |        |      | High                                                    | 11.2   | 24.0 |
|                                                          |        |      | Medium                                                  | 39.8   | 36.6 |
|                                                          |        |      | Low                                                     | 30.6   | 11.6 |
| 50 to 64<br>years old                                    | 18.9   | 17.3 | Very High                                               | 10.4   | 21.7 |
|                                                          |        |      | High                                                    | 7.3    | 17.6 |
|                                                          |        |      | Medium                                                  | 24.3   | 37.8 |
|                                                          |        |      | Low                                                     | 58.0   | 22.8 |

Relative France-US hiring and firing rates, selected labor market groups



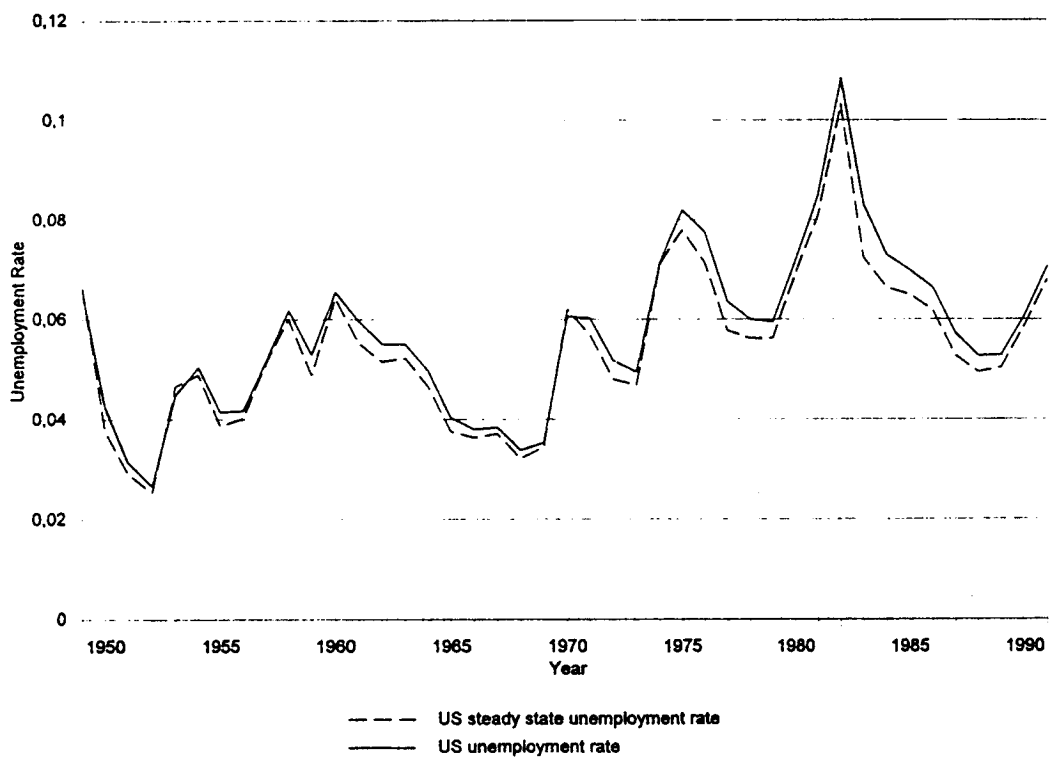
PICTURE 1

# ACTUAL AND STEADY STATE UNEMPLOYMENT RATES FRANCE, 1969-1993



PICTURE 2

ACTUAL AND STEADY STATE UNEMPLOYMENT RATES  
FRANCE, 1949-1991



PICTURE 3