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By: Arnaud Lefranc

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Arnaud Lefranc*

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Abstract

The objective of this paper is to provide a comparative assessment of the consequences of worker displacement in France and the United States. I estimate wage losses of displaced workers in the two countries and examine the relative contribution of two important sources of post-displacement wage adjustments. The first one relates to the loss of seniority-accumulated firm-specific earnings potential. The second one arises from match heterogeneity. Identification of the relative contribution of these two sources can be achieved given separate estimates of returns to seniority. I show that, while the order of magnitude of total wage losses are comparable in the two economies (10 to 15%), the sources of wage adjustments differ strongly: all of the wage decline in France seems to be due to the loss of accumulated firm-specific earnings potential, while in the US, more than half of measured wage losses arise from a downgrading of displaced workers into lower quality job matches.

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Keywords: Wage losses; Unemployment; Displaced workers; Returns to seniority; Match heterogeneity.

* THEMA, Université de Cergy-Pontoise, 33 Boulevard du Port, 95011 Cergy, France; lefranc@eco.u-cergy.fr. I thank Orley Ashenfelter, Daniel Cohen, Hank Farber, Alan Krueger, Gilles Saint-Paul and conference participants at the William Davidson Institute - IZA - Upjohn Institute conference on Labor Reallocation for useful discussions. Part of this paper was written while I was visiting the Industrial Relations Section at Princeton University and I wish to thank this institution for its hospitality.

1 Introduction

The microeconomic consequences of worker displacement, defined as permanent job losses, independent of individual performance, and arising from industrial restructuring, plant closing and mass layoff, have recently received considerable attention. While existing research has brought a detailed description of the US case, evidence from European countries is still relatively sparse.[1] Furthermore, for both Europe and the US, the structural determinants of observed post-displacement outcomes remain largely unknown. The objective of this paper is to provide a comparative assessment of the extent and the determinants of post-displacement individual wage adjustments in France and the United States.

From a descriptive point of view, numerous studies have analyzed, over the last decade, the impact of such worker dislocation on individual earnings in the United States, and have provided strong evidence that the average US displaced worker suffer severe earnings losses, on the order of 10 to 25%. Furthermore, they have shown that these earnings losses not only arise from the occurrence of post-displacement joblessness but also originate, to a large extent, from a persistent fall in individual wages, upon re-employment.

More recently, several papers have also investigated whether comparable post-displacement wage adjustments were at work on presumably rigid European labor markets. Available evidence suggest that, on average, European displaced workers experience significant but possibly smaller wage losses than their US counterparts. However, a strict comparison with US results is often hindered by cross-study

[1] See Kuhn (2002) and the references therein for available evidence on European countries.

differences in econometric specification and in the definition and measurement of worker displacement. Hence, whether worker displacement implies similar wage losses in Europe and the US largely remains an open question. The first contribution of this paper is to address this question, by estimating wage losses of displaced worker using a single econometric framework and comparable longitudinal micro-data from the French Employment surveys and the US Panel Study of Income Dynamics.

Obviously, one should not *a priori* expect worker dislocation to induce similar wage losses for displaced workers in the two countries, since wage losses will result from several aspects of wage-setting mechanisms that are likely to vary across countries. Unfortunately, in this respect, the structural determinants of observed wage adjustments have to a large extent remained unstudied. In fact, it is striking to notice that post-displacement wage losses have received very different interpretations on both sides of the Atlantic. In the United States, worker displacement is often seen as the disruption of an on-going long-term employment relationship and many papers tend to attribute observed wage losses to the loss of firm or industry seniority. According to this point of view, post-displacement wage adjustments would result from the loss of accumulated firm- or industry-specific earnings potential originating from specific human capital accumulation or compensation deferral. On the contrary, the European commonsense usually stresses the role of job match heterogeneity in the explanation of post-displacement wage adjustments and the lack thereof. It sees post-displacement outcomes as the result of displaced workers' job search strategy among heterogeneous jobs: according to this interpretation, observed wage losses would mostly reflect the extent to which displaced workers are willing (or able) to

take on low-paying jobs in order to return to employment, regardless of previous job seniority. While *both* accumulated firm-specific earnings potential and match heterogeneity are likely to contribute to post-displacement wage adjustments in Europe and the US, no systematic account of the contribution of each of these two determinants has been provided yet.

The second contribution of this paper is to empirically disentangle these two components and provide an analysis of the determinants of post-displacement wage adjustments. Beyond the descriptive comparison of wage losses in Europe and the US, identifying the sources of observed wage adjustments appears important for at least two reasons. First, from an analytical point of view, it may help characterize the specificities of labor market dynamics and wage-setting mechanisms at work in different countries. Second, from a prescriptive point of view, it may also help determine what type of public policy, e.g. training or job search assistance, could best alleviate the individual cost of worker displacement.

Previous research has already provided evidence that wage losses rise with pre-displacement seniority. Yet, this descriptive result falls short of identifying the contribution of intra-firm wage-seniority dynamics to observed wage losses, since higher pre-displacement seniority can also be associated with higher pre-displacement match quality. Unlike previous research on worker displacement, this paper takes into account the endogeneity of pre-displacement seniority. It relies on separate estimates of the within-firm returns to seniority, in each country, to determine the contribution of seniority-related firm-specific earnings potential to observed wage losses and to residually assess the contribution of match heterogeneity.

Two main results emerge from this paper. First, it appears that wage losses experienced by French displaced workers amount, on average, to about 10-15%, a figure only slightly lower than wage losses estimated for displaced US workers. Second, the analysis of the sources of wage adjustments reveals that, despite a comparable order of magnitude, the underlying determinants wage losses differ markedly in the two countries: in France, most of observed wage losses arise from the loss of seniority-related firm-specific earnings potential, while in the US, wage losses are primarily explained by a downgrading of displaced workers into lower quality matches, beyond the loss of seniority-related earnings components.

The rest of the paper is organized as follows. In section 2, I analyze, from a theoretical perspective, the structural determinants of post-displacement wage adjustments and discuss related work from previous research. In section 3, I discuss the empirical estimation procedure and describe the data used in the empirical analysis. Section 4 presents basic estimates of wage losses of displaced workers and section 5 examines the contribution of pre-displacement job seniority and match heterogeneity to estimated post-displacement wage adjustments.

2 Determinants of post-displacement wage losses : a theoretical discussion

The estimation of wage losses of displaced workers usually involves a comparison of post-displacement wage to either pre-displacement earnings or to a counterfactual of what individual earnings would have been in the absence of displacement. Consequently, understanding the impact of job displacement requires an analysis of

both the pre-displacement wage structure and the post-displacement re-employment process. In this section, I lay out a simple model of labor market dynamics to analyze the determinants of post-displacement wage adjustments and discuss results from previous research.

2.1 A simple model of labor market dynamics and post-displacement wage losses

Consider an economy where homogeneous workers can be either employed or unemployed. Unemployed workers receive job offers with probability λ_0 per period of time. The economy consists of two types of firms : high-wage firms paying entry wage level w^H and low-wage firms paying entry wage level w^L, with $w^L < w^H$. Let p denote the probability that the job offered be of the high-wage type, conditional on receiving a job offer. For now, wage heterogeneity can, indifferently, be seen as the result of either heterogeneity in match productivity or non-competitive wage rents.

For simplicity, assume that job termination is a deterministic event: employed workers are exogenously displaced two periods after they entered the employment pool, regardless of previous employment history, and flow back into unemployment.[2] Over the course of their employment spells, workers receive alternative job offers with probability λ_1 per period of time, that are drawn from the same distribution as for unemployed workers. For workers staying with the same firm in period 2, assume that wage grows at a rate g per period of time and that on-the-job wage growth is

[2] As a consequence, job-to-job movers do not increase their expected employment duration by changing jobs. This strong assumption implies that job switching decision is only governed by wage considerations, as would be the case in an infinite horizon model with Markov separations. See for instance Bunzel *et al.* (1999) for a complete analysis of job search strategies with on-the-job wage growth in a stochastic separation model.

firm-specific. Workers employed in high-wage firms will never change firm over the course of their employment spell. Workers employed at low-wage firms will change job when receiving a high-wage offer, as long as $w^H/w^L > (1+g)$ which will be assumed throughout the rest of this section.

In this setting, unemployed workers job search strategy consists of two options: either accept high wage offers only (denoted strategy I) or accept all job offers (denoted strategy II).[3] Strategy I trades a higher expected gain when exiting unemployed against a lower probability of finding a job. Depending on the value of the relevant structural parameters, this strategy may yield higher expected discounted pay-off than the alternative of accepting all types of offers. Higher unemployment benefits, a larger discrepancy between w^L and w^H, a higher value of λ_0 or a lower value of λ_1 will make this situation more likely to occur.

As a consequence, two equilibria may arise on the labor market. These two equilibria will differ not only in terms of unemployment dynamics but also in terms of inter-firm mobility and wage dispersion. The main characteristics of each equilibrium are summarized in table 1.

The case where unemployed workers are willing to accept all job offers exhibits low unemployment, high worker mobility (both out of unemployment and between jobs) and high equilibrium wage dispersion.[4] In this case, equilibrium cross-section wage dispersion arises from three factors. The first one is the initial dispersion in accepted wage offers. The second one is the opportunity for workers in low-wage

[3] I rule out the possibility for unemployed workers to never accept any offer, assuming for instance that unemployment benefits are lower than w^H.

[4] Unemployment rates reported in table 1 derive from the usual flow equilibrium condition. Equilibrium unemployment rate is given by $s/(s+h)$, where s and h denote the exit rate from employment and unemployment respectively. Under strategy L, h is equal to λ_0. Furthermore, in this simplified model the equilibrium aggregate exit rate out of employment is $1/2$.

firms to move to high-wage firms at the end of their first period of employment. The third source of wage heterogeneity is on-the-job wage growth: even controlling for entry wage level, w^H or w^L, employed workers are still heterogeneous in terms of job seniority and thus wage rate .

On the contrary, when unemployed workers are only willing to accept high-wage job offers, the labor market equilibrium exhibits higher unemployment and lower worker mobility: unemployment duration is higher and there is no direct inter-firm worker mobility. This case also exhibits a lesser degree of cross-section wage dispersion: there is now a single entry wage level and wage heterogeneity only arises from heterogeneity in job seniority.

2.2 Sources of wage losses

In this model, workers exogenously separated from their current employer after two periods in employment will, on average, experience wage losses upon re-employment. Table 1 reports wage losses of displaced workers for each possible labor market equilibrium.[5] It emphasizes two major sources of wage adjustments following job displacement.

The first one relates to on-the-job wage growth: workers who stayed with the same firm for two periods lose the firm-specific additional earnings potential g that they had accumulated as they increased their seniority with their pre-displacement employer. We will henceforth refer to this source of wage losses as A-losses.

The second source of wage adjustments arises from on-the-job search. Workers

[5]Here, wage losses of displaced workers are defined as the average relative difference between pre-and post-displacement wage.

exiting unemployment into a low-wage firm have an opportunity to subsequently move to a high-wage firm. Hence, the probability of being employed in a high-wage firm is higher at the time when displacement occurs than at the time of re-employment. This higher probability of being in a high-wage firm represents the benefits derived from extended job search and will be lost upon job displacement. We will henceforth refer to this source of wage losses as S-losses.

In order to clarify the distinction introduced here, it is worth emphasizing that, in both cases, wage losses originate from the existence of some earnings components that cannot be transferred to the post-displacement job. What really distinguishes A-losses from S-losses is the specific aspect of labor market dynamics that has led to the emergence of these non-transferable earnings components. A-losses, reflect non-transferable earnings components that were accumulated with seniority on the pre-displacement job and solely rely on the intra-firm dynamics of wages and seniority. On the contrary, S-losses reflect non-transferable earnings components acquired through extended on-the-job search and inter-firm worker mobility and result from the external labor market dynamics of job prospection.

This can be illustrated by comparing the two possible equilibria of our simple model. These two equilibria exhibit different mixes of A- and S-losses. Under job search strategy I, there are no gains from on-the-job search and workers stay with the same employer for two periods. The only source of wage adjustments is A-losses that amount to g. Under strategy II, a fraction $\lambda_1(1-p)$ of displaced workers will have moved from a low-wage match to a high-wage match at the time of displacement. These workers will not have accumulated any firm-specific earnings potential g at the time of displacement and will only incur S-losses. The rest of

displaced workers will incur A-losses. In this second case, average S-losses amount to $\lambda_1(1-p)(w^H - w^L)/\overline{w}$ and average A-losses amount to $g[1-\lambda_1(1-p)w^L/\overline{w}]$.

Decomposing observed wage losses along these lines, as will be done in the rest of this paper, can first provide an empirical assessment of the different factors contributing to individual wage dynamics. Furthermore, this decomposition can also be useful in addressing several analytical and policy-related issues regarding the consequences of worker displacement. One important concern, underlying early studies, is that worker displacement may induce severe efficiency losses arising from the destruction of specific human capital. Absent any measurable concept of specific human capital, this notion is often proxied, in empirical work, by job tenure within a given firm, which in turn suggests to assimilate efficiency losses with A-losses. The theoretical analysis developed here indicates that this interpretation cannot be taken for granted. First, A-losses may not necessarily correspond to a loss of specific human capital, since upward sloping wage-seniority profiles can also arise from compensation deferral, as in Lazear (1979), absent any form of specific human capital investment. Secondly, part of S-losses may reflect efficiency losses as well. This will be the case if inter-firm wage heterogeneity reflects heterogeneity in match productivity, as in Jovanovic (1979). Under this interpretation, job search appears as a productive activity and S-losses will incorporate match-efficiency losses. This suggests two major caveats in the analysis of efficiency losses: first, efficiency losses may go beyond accumulated firm-specific human capital, and, second, they cannot unambiguously be measured absent complementary information on individual productivity, usually not available in survey data.

Beside efficiency losses, wage losses of displaced workers can also be analyzed in terms of social fairness. In this matter, the A-S distinction yields stronger prescriptions. A-losses appear unambiguously unfair, regardless of the ultimate determinants of a positive wage-seniority relationship, be it the acceptance of initial underpayment or the costly investment in specific human capital. On the contrary, unless access to better matches can be ascribed to inter-individual differences in job search effort (as opposed to luck), S-losses may appear less unjust and can be seen, from the worker's perspective, as the re-distribution of job-search rents.

Finally, distinguishing these two sources of wage adjustments can be informative for the design of public policies aimed at alleviating the individual cost of worker displacement. If wage adjustments mostly arise from S-losses, then job-search assistance policies may be more successful in attenuating post-displacement wage losses. On the contrary, if A-losses are the driving force, training policy would appear more adequate.

2.3 Discussion of previous research

Several papers have previously analyzed the determinants of wage losses induced by worker displacement, essentially for the United States. Among the likely suspects considered in empirical work are "*the development of nontransferable human capital in a job, unionization, good job matches, efficiency wages, internal labor markets and incentive pay mechanisms*" (Kletzer, 1998, p.127). These different explanations can be straightforwardly linked to the distinction between A-losses ("development of nontransferable human capital", "internal labor markets and incentive pay mechanisms") and S-losses ("unionization, good job matches, efficiency wages") considered

here. However, despite extensive descriptive evidence, there still remains considerable uncertainty on the empirical contribution of each of these different explanations.

Many studies, including, among others, Farber (1993), Ruhm (1987), Kletzer (1989) and Kuhn and Sweetman (1998), have focused on the impact of job seniority on post-displacement outcomes and have established that wage losses rise with pre-displacement tenure.[6] This result has usually been interpreted as evidence of "*the importance of specialized human capital that accumulated with time*" (Topel, 1990). It also lies at the heart of Hamermesh (1987)'s estimation of the social losses implied by job displacement. There are, however, two challenges to this interpretation. First, as already mentioned, positive returns to firm seniority may arise from factors other than specific human capital accumulation. Secondly, as emphasized in Abraham and Farber (1987), Altonji and Shakotko (1987), and a later paper by Topel (1991), pre-displacement job seniority may be endogenous and positively related to match quality. Consequently, the relationship between seniority and wage losses of displaced workers can neither identify the extent of specific human capital losses nor the contribution of seniority-accumulated firm-specific earnings potential, i.e. A-losses.

Other papers have also stressed that displaced workers changing industry upon re-employed usually experience larger wage losses (Swaim and Podgursky, 1987; Jacobson, Lalonde and Sullivan, 1993b). Furthermore, it has also been shown that wage losses rise more with pre-displacement seniority for industry changers than for industry stayers (Neal, 1995). This has often been interpreted as evidence that, to

[6]For instance, Farber (1993)'s estimates imply that one additional year of pre-displacement seniority increase wage losses by about 1 percentage point.

some extent, specific human capital accumulated in a given firm may be partially transferred to other firms in the same industry. This suggests that the measurement of A-losses should incorporate this additional dimension of accumulated earnings potential specificity. However, as noted in Kletzer (1996) this portability of specific human capital across firms within a given sector seems limited to a narrow number of industries. Furthermore, larger wage losses for more senior industry switchers may also arise from S-losses in the presence of industry-specific labor market rents (Krueger and Summers, 1988). The contribution of pre-displacement rents, is also confirmed by evidence that workers displaced from larger firms and/or unionized jobs usually experience larger wage losses (Carrington and Zaman, 1994; Krashinsky, forthcoming).

Lastly, different papers concerned with high-unemployment European countries have also suggested that wage losses of displaced workers may be used to infer the level of individual reservation wages, as they reflect post-displacement job search strategies.[7] The preceding theoretical model indicates that, while unemployment search strategy clearly influences post-displacement outcomes, it is by no means the sole determinant of wage losses. On the one hand, A-losses appears only determined by pre-displacement job duration and returns to seniority. On the other hand, lower reservation wages clearly lead to higher S-losses, as they will increase the prospects for subsequent profitable inter-firm mobility. Unfortunately, S-losses also depend on the rate of arrival of alternative job offers. Hence, low S-losses cannot be unambiguously ascribed to high unemployed workers reservation wages and can

[7]See for instance Leonard and Van Audenrode (1995), Cohen *et al.* (1997) and Rosolia and Saint-Paul (1998).

only provide a reduced form assessment of the joint contribution of several factors influencing external labor market dynamics.

3 Econometric models and data description

3.1 Econometric specifications

3.1.1 Wage losses

From a descriptive perspective, the effect of job displacement on individual earnings can be empirically analyzed using an augmented Mincerian earnings model borrowed from Jacobson, LaLonde and Sullivan (JLS) (1993a):

$$w_{i,t} = \alpha_i + X_{i,t}\beta + D_{i,t}\delta + \gamma_t + \varepsilon_{i,t} \tag{1}$$

where, $w_{i,t}$ denotes the logarithm of individual i's wage at time t; $X_{i,t}$ is a vector of observable individual characteristics; $D_{i,t}$ is a dummy variable equal to one if individual i was displaced at some point before time t; α_i is an individual fixed effect; γ_t represents a time-varying effect common to all workers; $\varepsilon_{i,t}$ is a mean zero iid error term. In this equation, the effect of worker displacement on subsequent earnings is summarized by the coefficient δ.

Different strategies have been previously implemented to estimate δ. The simplest one consists in a cross-section estimation of equation 1 on a sample of displaced and non-displaced workers. In the presence of individual fixed effects, this will yield an inconsistent estimator of δ if, on average, displaced workers have different unmeasured characteristics α_i. Using the difference between pre- and post-displacement

wages of displaced workers to identify δ, as often done in studies based on the CPS Displaced Worker Survey, eliminates individual heterogeneity bias but at the cost of other possible inconsistencies, since it will confound changes in X_{it} and γ_t with the effect of worker displacement.

In this paper, I use a "difference-in-difference" estimation of equation 1 to measure the effect of worker displacement on wages, δ. This amounts to estimate the following model:

$$w_{i,t} - w_{i,t-\tau} = (X_{i,t} - X_{i,t-\tau})\beta + (\gamma_t - \gamma_{t-\tau}) + D_{i,t}\delta + (\varepsilon_{i,t} - \varepsilon_{i,t-\tau}) \qquad (2)$$

where $D_{i,t}$ will be equal to one for workers displaced between time $t-\tau$ and t. Equation 2 is estimated on a sample composed of displaced and non-displaced workers. The latter reference group allows to identify both $(X_{i,t} - X_{i,t-\tau})\beta$ and $(\gamma_t - \gamma_{t-\tau})$. Following JLS, I restrict the reference group of non-displaced workers to individuals who have stayed with the same firm between $t-\tau$ and t.

Since most observed individual earnings determinants (e.g. education, marital status, region of residence) will be constant between $t-\tau$ and t, $X_{i,t} - X_{i,t-\tau}$ will only capture the impact of changes in labor market experience. For all observations, this will be fixed and equal to τ given that only potential experience is measured in my data. Yet, in order to account for non-linearities and heterogeneity in experience-wage profiles, estimation of equation 2 will incorporate individual experience at date $t-\tau$ and level of education, as control variables for $X_{i,t} - X_{i,t-\tau}$. Estimation of 2 will also include state-dummies in order to account for regional differences in overall wage growth $\gamma_t - \gamma_{t-\tau}$. Lastly, equation 2 includes year dummies to capture

variations over time in aggregate wage growth.

3.1.2 Determinants of wage losses

The decomposition discussed in the previous section can be incorporated to the empirical analysis by modelling the contribution of worker seniority and match heterogeneity to individual earnings. To do so, consider the following model[8]:

$$w_{i,t} = \alpha_i + X_{i,t}\beta + S_{i,t}\psi + \phi_{i,t} + \gamma_t + \varepsilon_{i,t} \tag{3}$$

where $S_{i,t}$ denotes firm-seniority and $\phi_{i,t}$ represents a fixed-effect specific to the firm or match of individual i at date t.[9] For non-displaced workers, the change in log wage between $t-\tau$ and t will be given by:

$$w_{i,t} - w_{i,t-\tau} = (X_{i,t} - X_{i,t-\tau})\beta + (\gamma_t - \gamma_{t-\tau}) + \tau\psi + (\varepsilon_{i,t} - \varepsilon_{i,t-\tau}) \tag{4}$$

Consequently, the effect of displacement on wages measured in equation 2 will be equal to:

$$\delta = \mathrm{E}[(S_{i,t} - S_{i,t-\tau} - \tau)\psi | D_{i,t} = 1] + \mathrm{E}[\phi_{i,t} - \phi_{i,t-\tau} | D_{i,t} = 1] \tag{5}$$

The two expectations in equation 5 respectively capture the contribution of losses of seniority accumulated firm-specific earnings potential (A-losses) and changes in

[8] To simplify notations, higher order terms in seniority have been omitted but are included in the estimation.

[9] In fact, firm and worker-firm match fixed effects cannot be distinguished without linked employer-employee data. Furthermore, $\phi_{i,t}$ may also capture industry fixed-effects that are not explicitly modelled here.

average match or firm quality (S-losses) to wage losses of displaced workers.

Again, adding an interaction term of the form $D_{i,t} \times S_{i,t-\tau}$ in equation 2 will not allow to measure the contribution of A-losses since $\phi_{i,t-\tau}$ will also be correlated with $S_{i,t-\tau}$. However, the contributions of A- and S-losses can be identified, provided that a consistent estimate of ψ is available. If so, one can define and compute $\omega_{i,t}$ the value of individual wages, net of returns to firm seniority, as $\omega_{i,t} = w_{i,t} - S_{i,t}\widehat{\psi}$. One can then estimate a variant of equation 2 using $\omega_{i,t} - \omega_{i,t-\tau}$ as a dependant variable.[10] In this case, the coefficient δ of the displacement dummy variable will be equal to $\mathrm{E}[\phi_{i,t} - \phi_{i,t-\tau} | D_{i,t} = 1]$, that is S-losses.

3.2 Data

The comparative analysis is based on a panel extracted from the French Employment surveys (enquêtes Emploi, henceforth FES) and on the US Panel Study of Income Dynamics (PSID).

3.2.1 French data

The FES is a labor force survey conducted each year by the French national statistics institute (INSEE) over a representative sample of approximately 60 000 households. All interviews take place during the month of March. The survey includes detailed information on individual characteristics (age, education, region of residence), job characteristics (industry, seniority), monthly wage earned during the previous month and number of hours worked. Unemployed job seekers at the time of the interview

[10] Note that this amounts to net out the effect of seniority in both the pre- and post-displacement jobs.

are asked to report the reason for unemployment. Individuals who changed employer during the previous year and those going through unemployment during the previous year but who are no longer unemployed at the survey date are not asked to report the reason for employer change or unemployment. Hence displacement status can only be assessed for individuals being unemployment at the time of the interview.

Among the different reasons for unemployment, the questionnaire distinguishes between voluntary quits, end of seasonal and fixed-duration contract, individuals previously out of the labor force, workers on "collective" permanent layoff (*licenciement collectif*) and workers on "individual" permanent layoff (*licenciement individuel*). The distinction between individual and collective layoff is based on the number of people being laid-off from a single firm at a given date: collective (respectively individual) layoffs correspond to situations where more (respectively less) than 10 workers at a time where terminated from the same firm. This distinction only partially matches the definition of worker displacement, as displaced workers are usually defined as workers losing their job for reasons independent of their individual performance or behavior. While workers on "collective" layoffs would certainly fit this definition, the situation of people on "individual" layoffs is more ambiguous and could correspond to either workers displaced from smaller firms or workers fired for poor work performance of behavior. In order to distinguish these two groups, I control, in the estimation, for two separate job displacement dummies: *Mass layoff* will be equal to one for individuals being unemployed and reporting a collective layoff; the second one *Other layoff / Fired* will be equal to one for unemployed workers on "individual " layoff.

This paper uses data from the 1990 through 1997 FES. Since one third of

the sample is renewed each year and each household is interviewed during three consecutive years, I can construct six three-year individual panels of labor market history. The final data set used in the estimations for France pools these six short panels. Given that displacement status is only observed for those being unemployed in a least one wave, and that estimation of equation 2 requires both a pre- and a post-displacement wage observations, displaced workers used in the estimation of wage losses will consist in individuals employed at date $t-2$, who subsequently lost their job and were still unemployed at date $t-1$ and who were re-employed at date t, where t denotes the last period of the three-year panel. The control group consists in individuals who stayed with the same firm between $t-2$ and t.

3.2.2 US data

The US data are taken from the 1983 through 1992 waves of the PSID. It provides information on worker and job characteristics very similar to the one collected in the FES, together with a wealth of data on individual and household income.[11] Earnings data used in this paper refer to hourly and weekly wage earned from the main job held as of the survey date.[12]

Assessing worker displacement status in the PSID exposes to ambiguities that are similar to those encountered with the FES. Among involuntary separations, the PSID distinguishes between two reasons for job termination. The first one

[11] As already noted in the literature, original self-reported tenure data exhibit many inconsistencies in the PSID. In numerous cases, year-to-year tenure variation for individuals staying on the same job fail to equal one. In such cases, job tenure data was recoded as in Topel (1991).

[12] The PSID provides two different variables for hourly wage rates: the first one is computed as the average of yearly labor income and hours on all jobs held during the previous year; the second one, used in this paper, is the self-reported hourly wage rate on the current main job at the time of the interview. Weekly wage rate is computed by multiplying this latter variable by the usual number of hours worked per week.

corresponds to workers who lost their job because *"their company folded, changed hands, moved out of town, their employer died or went out of business"*. We define a *Mass layoff* dummy equal to one for individuals in this group. The second reason for termination corresponds to workers who were *"laid off or fired"*. Again, this group is likely to include workers being terminated for reasons related to individual characteristics. We define an *Other layoff / Fired* dummy variable equal to one for workers in this category who do not return to their previous employer and zero otherwise. In order to insure comparability with our French sample of displaced workers, we further restrict our sample of displaced US workers to individuals who experienced some spell of unemployment.[13]

As for our French sample, estimation of equation 2 uses two-year changes in log individual wages. Since our PSID data cover the period 1983-1992, each individual in the sample contributes multiple wage changes observations to the estimation. For each year $t \in [1985,1992]$, we assign individual-year observations to the displacement groups if individuals report the occurrence of a job displacement, as defined above, between t and $t-2$.[14] The control group consists of individuals who stayed at the same firm between t and $t-2$.

[13]Not imposing the additional restriction that displaced workers experience unemployment has the following effects on estimated wage losses. For individuals in the Mass layoff group, estimated wage losses are about .03 log points lower (in absolute value), but the difference is only significant for highly educated workers. For individuals in the Other layoff / Fired group, it decreases estimated wage losses by .01 log points but the difference in estimates is not significant.

[14]Restricting the displacement sample to individuals dismissed between $t-1$ and $t-2$ would more closely match the definition of the French displacement sample, but would strongly reduce the size of the sample, without significant effect on estimated wage losses.

3.2.3 Samples restrictions and description

I restrict my final samples to male heads of household aged 25 to 55 years old in $t-2$ and exclude self-employed workers from the analysis. Imposing these restrictions gives a sample of 3100 individuals and a total of about 12625 observations in the PSID data and a sample of 20904 individuals and observations in the FES panel.

The main characteristics of each sample are given in table 2. In the FES, 531 individuals experience a displacement episode that can be assessed based on reports at date $t-1$.[15] The PSID data provides a total of 568 displacement episodes.

For both countries, I define a three-level educational classification. In the US, *low* education corresponds to high-school dropouts; *medium* education to high school graduates; *high* education to levels of education higher than high school. The classification for France takes into account the lower average educational attainment of the French workforce: *medium* education includes individuals with a vocational degree lower than high school and individuals with upper secondary education who did not complete high school; *high* education includes high-school graduates (*baccalauréat*) and above; *low* education corresponds to individuals with less than an intermediate vocational degree. On average, in both countries, displaced workers tend to have lower education than the control group of job stayers. Overall, they also tend to be younger and have less firm seniority at date $t-2$, although French displaced workers tend to have higher pre-displacement seniority than their US counterparts.

Lastly, in both countries, displaced workers experience nominal wage losses,

[15] A total of 1086 individuals experience a displacement episode that can be assessed using reports at date t and $t-1$.

around -.07 log points in France and -0.4 log points in the US, while job stayers experience nominal wage gains, around .06 log points in France and .10 in the US.

4 Wage losses in France and the United States

4.1 Basic results

Table 3 presents estimates of the average effect of job displacement on wages in both countries. All estimates are based on equation 2.

Estimates based on PSID data (column 2 and 10) corroborate results from other studies of job displacement in the US.[16] On average displaced workers experience a .15 log points fall in weekly wages relative to the control group of job stayers (column 2) and wage losses appear very similar for the two groups of displaced workers. This fall in wages appears primarily driven by a .13 log points fall in hourly wage (column 10). The discrepancy between estimates based on weekly and hourly wages also indicates that change in hours of work might partially account for the fall in weekly earnings, a fact that is consistent with the finding mentioned in Farber (1993) that a significant fraction of pre-displacement full-time workers return to a part-time job.

In France, displaced workers also experience significant wage losses. Relative to job stayers, French workers displaced in a mass layoff suffer a .12 log points fall in weekly wage and a .09 log points fall in hourly wage rate. Workers laid-off in other circumstances or fired experience slightly larger wage losses: weekly wage losses

[16] See for instance Kletzer (1998) for a survey and Ruhm (1991) for estimates of wage losses of displaced workers based on PSID data.

amount to .15 log points and hourly wage losses to .13 log points. These higher wage losses for workers in this group are consistent with the fact that part of these workers may have been dismissed for reasons related to individual performance or behavior.[17] Comparison of hourly and weekly wage losses indicates that in France, job displacement also induces a change in hours worked.

However, given the long average duration of unemployment in France and the constraints related to the identification of job displacement status in the FES, only about one half of the French mass layoff sample and one third of the Other layoff / Fired sample have returned to employment in period t. This may lead to unrepresentative estimates of wage losses of displaced workers for France if the re-employment and wage adjustment process differ for the censored observations. Table 2 allows to compare the characteristics of re-employed displaced workers to those of the overall displaced sample. For the Mass Layoff group, the two samples appear very similar, while for the Other layoff / Fired group, re-employed displaced workers tend to have lower pre-displacement seniority. To examine possible sample selection in the wage losses and re-employment process, table 7 provides Heckman two-step estimates of an individual wage growth equation. Variables included in the re-employment equation and excluded from the wage growth equation are unemployment duration at date $t-1$ and, for workers in the Other layoff / Fired group, seniority in $t-2$.[18] While both variables have a significant influence on the probability of re-employment, panel B of table 7 provides no indication of

[17] For these workers job displacement might signal lower intrinsic productivity, which may in turn induce larger wage losses, as suggested in Gibbons and Katz (1991).

[18] As discussed in section 4.3 for pre-displacement seniority does not seem to influence wage growth for Other layoff / Fired displaced workers.

significant selection effect, a result that is consistent with previous studies that have cast doubt on the importance of selection bias in estimates of the wage losses of displaced workers.[19].

Overall, these results suggest the existence of significant post-displacement wage losses in France, that are only slightly lower than those found for displaced US workers. Hence, the consequences of worker displacement on individual welfare does not appear particularly milder in France, which stands at odd with the common view of a "rigid" French labor market.

4.2 Results by level of education

This general picture still holds when one split the total sample by level of education, according to the classification described in section 3.2.

For workers with a medium level of education, wage losses appear higher in the US than in France. The fall in weekly wage amounts to .17 (mass layoff) and .15 (other layoff or fired) log points in the US, and to .13 and .9 log points in France. The fall in hourly wage rate appears, again, slightly smaller: .14 and .15 log points in the US and .11 and .07 log points in France. Overall, this suggests that French displaced workers in the intermediate education group experience wage losses that amount, on average, to about two thirds of those experienced by their US counterparts.

The cross-country differences in wage adjustments appear more pronounced for individuals with a low level of education. In the US, low education workers displaced in a Mass layoff experience a larger fall in weekly wage (.23 log points) than workers with an intermediate level of education and a comparable fall in hourly wage rates

[19]See for instance Swaim and Pogdursky (1987) and Houle and Van Audenrode (1995)

(.14 log points). In France, low education workers displaced in a mass layoff suffer weekly wage losses of .10 log points and hourly wage losses of -.07 log points, which appears to be *smaller* than the wage losses experienced by French workers with an intermediate level of education. As a consequence, for low education individuals in the mass layoff group wage losses in France amount to only half of the estimated wage losses for similar US workers. While several factors may explain smaller wage adjustments in France than in the US, this specificity of wage adjustments at the bottom end of the skill distribution might possibly be accounted for by the existence of a binding minimum wage, a point we will return to in section 5. However, comparison of workers in the Other layoff / Fired group in the two countries yields less clear cut conclusions since workers in this group seem to experience similar weekly wage adjustments in the two countries.

Lastly, comparison of post-displacement wage adjustments for displaced workers with a high level of education does not indicate any significant differences between France and the US. For both countries, estimates in columns 3 and 4 indicate similar wage losses for each displacement group across the two countries. On the other hand, the two displacement groups seem to experience, in both countries, very different patterns of post-displacement wage adjustments. While these results might be interpreted as evidence that non-mass layoff is more stigmatizing for highly skilled individuals, one may also suspect that the distinction between these two causes of separation might also appear less relevant for this education group. Furthermore one should also emphasize that wage losses are not precisely estimated for this education group.

Overall, several important features emerge from this comparison by level of

education. Firstly, there does not seem to be any clear and systematic differences in wage adjustments in the two countries, at the higher end of the skill distribution. On the contrary, the wage losses seem to be lower in France than the US for the low and intermediate levels of education. This seems particularly true for workers at the bottom of the skill distribution and for hourly wage rate adjustments.

4.3 Wage losses and pre-displacement seniority

Finally, table 4 provides descriptive evidence on the impact of pre-displacement seniority on post-displacement wage adjustments. All estimates are based on equation 2 where the displacement dummy has been interacted with seniority on the job lost. For workers displaced in a mass layoff, higher seniority is significantly associated with higher wage losses consecutive to job displacement. In both countries, one additional year of seniority increases losses in weekly wage by .015 log points. For hourly wage rate, similar figures amount to .009 log points in France and .013 in the US.

For workers displaced in circumstances other than a mass layoff, pre-displacement seniority does not affect post-displacement wage losses. This may be explained by the fact that this latter group includes both workers who have been laid-off and worker who have been fired for cause. If dismissal for poor individual performance or behavior is more likely at the earliest stage of a worker career within a firm, then, among individuals in the Other layoff / Fired group, the proportion of individuals who have been fired for cause will be higher at low seniority levels. Furthermore one would expect post-displacement wage adjustments to be higher for individuals who have been fired for cause, given pre-displacement seniority. On the contrary,

among workers being terminated for exogenous reasons, one would expect higher wage losses for more senior workers. These two effect might then cancel out in the heterogeneous group of workers fired and displaced in a non-mass layoff, if the proportion of each sub-category varies with pre-displacement seniority.

5 Determinants of observed wage losses

We now turn to the economic determinants of observed wage adjustments following job displacement. As already discussed, given a consistent estimate of returns to seniority in each country, it is possible to decompose observed wage losses of displaced workers into losses of seniority-accumulated earnings potential, A-losses, and firm or match heterogeneity, S-losses. In the rest of the paper, I estimate the effect of job seniority on individual wage and implement the decomposition discussed in section 3.1.2.

5.1 Returns to seniority

There has been an important debate surrounding the estimation of the effect of seniority on wages.[20] As pointed out by several authors, the major estimation problem stems from the possible endogeneity of seniority with respect to wages in the presence of heterogeneous workers and/or firms. In order to solve this endogeneity issue, I estimate returns to seniority using Topel (1991)'s two-step estimation procedure. The estimation is performed for the period 1990-1997 for France and 1978-1992 for the US. Results are presented in table 5.

[20]See Abraham-Farber (1987), Altonji-Shakotko (1987) and Topel (1991) for the main contributions to this debate.

Comparison of columns 1 and 2 indicates very similar returns to experience and seniority in the two countries. Early on the job, one additional year of seniority rises hourly wage rate by .017 log points in both cases. The marginal effect of seniority on earnings decreases with time on the job. Concavity of wage-seniority profiles appears slightly more pronounced in the US than in France: for instance, 10 years of seniority appear to increase wages by .14 log points in France against .11 log points in the US. Regarding the effect of general experience on earnings, one should note that while the effect of the linear term in experience appears larger in France this is compensated by a more concave profile. Overall the estimated effect of experience also seems very similar in the two economies: 20 years of experience appear to increase wages by .22 log points in France against .20 log points in the US.

These results should be compared to estimates found in previous research. The effect of seniority estimated here differs from results reported in Topel (1991)'s article. As can be seen by comparing columns 2 to 4 of table 6 this discrepancy mostly results from the fact that Topel's estimates make use of a wage variable computed from yearly reports of earnings and hours worked. As demonstrated in Altonji and Williams (1997) and Lefranc (forthcoming), the existence of important measurement errors and inconsistencies in this latter variable leads such estimates to overemphasize the effect of seniority on earnings. On the other hand, results found here agree with estimates reported in several recent papers. In particular, results presented in columns 1 and 2 corroborate those presented in Altonji and Williams (1997) and are also consistent with estimates based on match employer-employee data that allow direct control for firm heterogeneity, *e.g.* Abowd et al. (1999) for

France and Bronars and Famulary (1997) for the United States.

5.2 *A*-losses or *S*-losses ?

These estimates of the returns to seniority enable us to examine the structural determinants of the gross wage losses examined in the previous section.

Table 6 presents estimates of the effect of job displacement on hourly wage rate net of the effect of accumulated firm seniority, for France and the US. As already explained, this corresponds to the extent of S-losses. Estimates for the total sample are given in columns 1 and 2. Comparison of these two columns reveals different patterns of wage adjustments in the two countries for workers displaced in a mass layoff. In France, residual wage losses, i.e. change in the wage rate net of accumulated returns to seniority, amount to only .03 log points. On the contrary, US workers displaced under similar circumstances experience larger S-losses, around .08 log points. Compared to results presented in table 3, this indicates that, in France, two thirds of observed adjustments in hourly wage rates are driven by A-losses and only one third is explained by S-losses; in the US, the relative contribution of the two sources of wage adjustments are reversed, with S-losses explaining between one half to two thirds of total wage losses.

Comparison of average residual wage losses for workers in the Other layoff / Fired group apparently suggests that this pattern no longer holds for individuals in this group. For this group, the extent of S-losses amount to about .09 log points in both countries. However, separate estimates by level of education suggest that this result is entirely driven by the higher education group. On the contrary, comparison of wage adjustments in the medium and low education groups confirms the small

contribution of S-losses to post-displacement wage adjustments in France, relative to the US. For the intermediate education group, the extent of S-losses in France amounts to .046 log point for workers in the Mass layoff group and a non-significant .034 in the Other layoff / Fired group. For the US, S-losses appear more than twice as large, amounting to .09 log points for the first group and .11 for the second group. The discrepancy between the two countries in the extent of S-losses appears even more pronounced in the low education group: for this category, in France, none of the two groups of displaced workers experience statistically significant S-losses while for their US counterpart S-losses amount to .08 log points and .04 log points for the Mass layoff and Other layoff / Fired groups respectively, which represents, again, between two-thirds and one half of total wage adjustments.

Several issues may challenge the validity of the decomposition underlying table 6. First, as discussed in section 2.3, part of accumulated firm-specific earnings potential may survive for workers finding re-employment in the same industry, in which case table 6 may underestimate the extent of S-losses. Table 8 provides estimates S-losses for the sub-sample of displaced workers who changed one-digit industry upon re-remployment. Results partly support the above conjecture, to the extent that estimated S-losses tend to be larger for industry switchers than for the total sample.[21] However, this table confirms, first, that for France, S-losses tend to be small in comparison to the US case and not significantly different from zero for low education workers and, second, that S-losses contribute an important fraction of total hourly wage losses in the US.

[21]However, equality of S-losses between switchers and stayers is never rejected at the 5% level except for high education non-mass layoff in France and medium education non-mass layoff in the US.

This decomposition may also lead to inconsistent estimates of S-losses if within-firm wage growth differs between displaced and non-displaced workers, before the occurrence of job displacement. In fact, results in Jacobson, LaLonde and Sullivan (1993a) indicate that earnings growth tend to be lower for displaced workers than for job stayers several quarters *before* displacement. Table 9 compares pre-displacement hourly wage growth of displaced workers to that of job stayers and finds little evidence of lower pre-displacement wage growth, suggesting that the pre-displacement dip in quarterly earnings is more likely to come from a reduction in the number of hours worked rather than a fall in hourly wage rate.

5.3 Comments

Overall, these results clearly indicate that, despite fairly similar gross wage losses, the nature of individual wage dynamics underlying the wage losses of displaced workers differs markedly between the two countries. In France, the change in log hourly wage after displacement appears primarily driven by the loss of returns to seniority accumulated on the pre-displacement job. In the US, forgone firm seniority also appears to triggers significant wage adjustments, around .054 log points.[22] But the major difference is that, in the US, on average, displaced workers experience further wage losses due to a downgrading into job matches whose quality is lower than the pre-displacement one. This finding confirms previous results by, among others, Topel and Ward (1992) that have underlined the importance of job prospection in career dynamics of US workers. On the contrary, in France, this

[22]The slightly higher incidence of lost specific human capital on displaced workers wage losses in France stems both from (slightly) higher returns to seniority and higher average seniority of displaced workers in this country.

downgrading into lower quality matches appears very moderate. This shows firstly that French displaced workers do not fall into markedly intrinsically worse jobs and secondly that career dynamics in France are essentially driven by intra-firm wage growth and not by labor market job prospection.

Ultimately, this lack of S-losses in France may arise from several features of the French labor market. In fact, on-the-job search will allow to access better paying jobs under two conditions: first the reception of alternative job offers, and second the existence of significant gains from job mobility, which relates to existence of significant interfirm wage differentials. Hence the small extent of S-losses may either result from a more compressed distribution of offered wages, from slack labor demand and the lack of alternative job offers or from high unemployed worker's reservation wages. To some extent a comparison of S-losses for the medium and low education groups may point out to the role of the French minimum wage in the explanation of small S-losses in France. Columns 8 and 10 in table 6 indicate that in the US, the extent of downgrading into lower paying jobs is quantitatively similar for low and medium skill individuals which does not hold for France. While in France, both skill groups share most of the specificities of the French labor market (job protection, unemployment insurance, wage bargaining) they are likely to be differently affected by the existence of a high minimum wage that may limit external wage dynamics by reducing both the scope of profitable job mobility and the intensity of labor demand for that skill group. However, this cannot explain the overall lower contribution of S-losses to total wage losses in France and the explanation of this important difference between the two countries should deserve further research.

6 Conclusions

Contrary to the common view of a sclerotic French labor market lacking individual wage flexibility, estimates obtained in this paper do indicate that job losses, in France, lead to sizeable wage losses for displaced workers. In fact, while the order of magnitude of these wage losses appears slightly lower than in the United States, overall welfare losses could turn out to be higher in France, if one were to take into account the higher duration of unemployment of displaced workers in France.

Yet, if welfare losses appear comparable in the two countries, my findings also reveal that the determinants of observed outcomes markedly differ. Losing one's job, on the French labor market, primarily leads to the loss of firm-specific earnings potential accumulated prior to job displacement, indicating that individual wage careers in France are essentially driven by intra-firm dynamics. In opposite, losing one's job on the US labor market also erodes the benefits of extended job search and bring workers down in the distribution of job offers. While intra-firm wage dynamics do play a role in individual careers, external labor market dynamics and the accumulation of search rents through job prospection seems to strongly contribute to individual wage growth, a phenomena that is hardly present in the French labor market.

These results also provide useful indications on the factors responsible for these differences in labor market dynamics in the two countries. While the forces governing wage losses of displaced workers on the US labor market appear similar across skill groups, the disaggregated analysis indicates that low education displaced workers in France experience lower total wage losses and no significant S-losses, two fea-

tures that could stem from the existence of binding minimum wage. However, the specific wage rigidities at the bottom of the French earnings distribution fall short of explaining the overall cross-country differences in post-displacement wage adjustment. More generally, several ingredients are likely to contribute to the limited role of external mobility in individual wage growth, including high reservation wages, mobility costs, slack labor demand, and wage compression. While the analysis undertaken here cannot discriminate between these different sources, this point should deserve particular attention in future research.

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Table 1: Labor market equilibrium and wage losses of displaced workers

Under Strategy *I*	**Under Strategy** *II*
- the density of observed wages is w_H with probability $1/2$ $w_H(1+g)$ with probability $1/2$	- the density of observed wages is w_L with probability $(1-p)/2$ $w_L(1+g)$ with probability $(1-p)(1-\lambda_1)/2$ w_H with probability $(p+\lambda_1(1-p))/2$ $w_H(1+g)$ with probability $p/2$
- unemployment rate is $1/(1+2\lambda_0 p)$	- unemployment rate is $1/(1+2\lambda_0)$
- unemployment duration is $1/\lambda_0 p$	- unemployment duration is $1/\lambda_0$
- the observed wage losses are $\Delta^I = g$	- the observed wage losses are $\Delta^{II} = g + \lambda_1(1-p)[w_H - (1+g)w_L]/\overline{w}$ where $\overline{w} = pw_H + (1-p)w_L$

Table 2: Sample description

	France				US			
number of individuals	21435				3100			
	All	Job stayers	Mass layoff	Other layoff / Fired	All	Job stayers	Mass layoff	Other layoff / Fired
number of observations	21435	20904	338	193	12625	12057	149	419
(% re-employed in t)			(45.9)	(35.2)			(93.3)	(95.7)
age in $t-2$ (in years)	38.1	38.1	37.9	37.1	36.48	36.61	34.71	33.22
			36.8	*35.1*				
seniority in $t-2$ (in years)	11.8	11.9	6.7	5.0	9.18	9.45	4.88	3.15
			6.5	*3.5*				
level of education (in %)								
high	28.0	28.3	14.8	21.8	29.6	30.1	24.2	16.9
			13.4	*25.0*				
medium	55.8	55.9	53.5	50.2	56.7	56.6	57.7	60.6
			56.7	*55.9*				
low	16.1	15.7	31.6	28.0	13.7	13.3	18.1	22.4
			29.9	*19.1*				
two-year change in log hourly wage	0.0616	0.0628	-0.0376	-0.0705	0.0983	0.104	-0.0281	-0.0215
two-year change in log weekly wage	0.0604	0.0619	-0.0776	-0.0886	0.1098	0.114	-0.0386	-0.0395

Notes: - *Mass Layoff* corresponds, in the US, to worker displaced after their "company folded, changed hands, moved out of town, or employer died or went out of business" and in France to "licenciements collectifs" (i.e. more than 10 separations from a single firm); - for France, displaced workers correspond to individuals employed in $t-2$ and unemployed after a job displacement; for the United States, displaced workers correspond to individuals employed in $t-2$, displacement between $t-2$ and t and who experienced a spell of unemployment; numbers in italics refer to French displaced workers re-employed by date t.

Table 3: Average wage losses of displaced workers in France and the United States

	A - change in log weekly wage							
			level of education					
			high		medium		low	
	France	US	France	US	France	US	France	US
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mass Layoff	-0.1212	-0.1516	-0.0646	-0.0598	-0.1469	-0.1758	-0.1017	-0.2348
	(0.0118)	(0.0234)	(0.0346)	(0.0450)	(0.0151)	(0.0317)	(0.0218)	(0.0562)
Other layoff / Fired	-0.1539	-0.1585	-0.3125	-0.2224	-0.0910	-0.1499	-0.1201	-0.1362
	(0.0179)	(0.0156)	(0.0383)	(0.0355)	(0.0229)	(0.0202)	(0.0413)	(0.0349)
R^2	0.0392	0.0327	0.0494	0.0541	0.0356	0.0245	0.0343	0.0638
n	21119	12020	5949	3588	11818	6824	3352	1608
	B - change in log hourly wage							
			level of education					
			high		medium		low	
	France	US	France	US	France	US	France	US
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Mass Layoff	-0.0872	-0.1293	-0.0439	-0.1000	-0.1098	-0.1429	-0.0679	-0.1391
	(0.0123)	(0.0188)	(0.0395)	(0.0413)	(0.0147)	(0.0239)	(0.0225)	(0.0414)
Other layoff / Fired	-0.1352	-0.1281	-0.2851	-0.1022	-0.0698	-0.1513	-0.1205	-0.0852
	(0.0186)	(0.0125)	(0.0438)	(0.0325)	(0.0224)	(0.0152)	(0.0426)	(0.0257)
R^2	0.0291	0.0329	0.0324	0.0390	0.0283	0.0350	0.0289	0.0505
n	21119	12020	5949	3588	11818	6824	3352	1608

Notes: - *Mass Layoff* corresponds, in the US, to worker displaced after their "company folded, changed hands, moved out of town, or employer died or went out of business" and in France to "licenciements collectifs" (i.e. more than 10 separations from a single firm); - all regressions include control for labor market experience, level of education, region of residence and year dummies; Numbers in parentheses are standard errors.

Table 4: Pre-displacement seniority and wage losses of displaced workers in France and the United States

	change in log weekly wage		change in log hourly wage	
	France	US	France	US
	(1)	(2)	(3)	(4)
Mass Layoff	-0.0308	-0.0641	-0.0334	-0.0538
	(0.0162)	(0.0314)	(0.0169)	(0.0252)
Mass Layoff	-0.0145	-0.0149	-0.0089	-0.0128
× predisplacement seniority	(0.0016)	(0.0035)	(0.0017)	(0.0028)
Other layoff / Fired	-0.1595	-0.1383	-0.1475	-0.1220
	(0.0218)	(.0192)	0.0228)	(0.0154)
Other layoff / Fired	-0.0000	-0.0057	0.0022	-0.0016
× predisplacement seniority	(0.0034)	(0.0032)	(0.0035)	(0.0026)
R^2	0.04314	0.0343	0.0306	0.0345
n	21112	12020	21112	12020

Notes: - *Mass Layoff* corresponds, in the US, to worker displaced after their "company folded, changed hands, moved out of town, or employer died or went out of business" and in France to "licenciements collectifs" (i.e. more than 10 separations from a single firm); - all regressions include control for labor market experience, level of education, region of residence and year dummies; Numbers in parentheses are standard errors.

Table 5: Returns to seniority in France and the United States

	France	US		
dependant variable	hourly wage	PSID 78-92 hourly wage (current)	PSID 78-92 hourly wage (yearly average)	Topel hourly wage (yearly average)
	(1)	(2)	(3)	(4)
First step estimates				
Experience+Tenure	0.0555	0.0599	0.1129	0.1258
	(0.0107)	(0.0104)	(0.0158)	(0.0162)
Experience^2/100	-0.189	-0.196	-0.213	-0.4067
	(0.0798)	(0.092)	(0.1347)	(0.1546)
Experience^3/1000	0.0385	0.0416	0.041	0.0989
	(0.0223)	(0.0296)	(0.0421)	(0.0517)
Experience^4/10000	-0.003	-0.003	-0.003	0.0089
	(0.0022)	(0.0032)	(0.0044)	(0.0058)
Tenure^2/100	-0.038	-0.104	-0.492	-0.4592
	(0.046)	(0.0657)	(0.1023)	(0.108)
Tenure^3/1000	0.0035	0.0308	0.1845	0.1846
	(0.0201)	(0.0328)	(0.048)	(0.0526)
Tenure^4/10000	0.0005	-0.004	-0.023	-0.0245
	(0.0028)	(0.0049)	(0.0069)	(0.0079)
Second step estimates				
Initial experience	0.0421	0.0421	0.0525	0.0713
	(0.0117)	(0.0114)	(0.0173)	(0.0181)
Tenure	0.0135	0.0178	0.0604	0.0545
	(0.012)	(0.0134)	(0.0205)	(.0079)

Notes: All estimates are based on Topel (1991)'s two-step model. Standard errors (in parentheses) account for sampling errors in first step estimates.

Table 6: Average wage losses of displaced workers in France and the United States - net of returns to firm seniority

			level of education					
			high		medium		low	
	France	US	France	US	France	US	France	US
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mass Layoff	-0.0309	-0.0786	0.0034	-0.0510	-0.0461	-0.0918	-0.0221	-0.0830
	(0.0134)	(0.0187)	(0.0415)	(0.0413)	(0.0158)	(0.0238)	(0.0254)	(0.0413)
Other layoff / Fired	-0.0913	-0.0879	-0.2354	-0.0471	-0.0346	-0.1165	-0.0470	-0.0425
	(0.0201)	(0.0125)	(0.0466)	(0.0325)	(0.0242)	(0.0152)	(0.0464)	(0.0256)
R^2	0.0259	0.0218	0.0291	0.0302	0.0245	0.0233	0.0283	0.0431
n	20417	11969	5718	3570	11465	6797	3234	1602

Notes: - *Mass Layoff* corresponds, in the US, to worker displaced after their "company folded, changed hands, moved out of town, or employer died or went out of business" and in France to "licenciements collectifs" (i.e. more than 10 separations from a single firm); - all regressions include control for labor market experience, level of education, region of residence and year dummies; Numbers in parentheses are standard errors.

Table 7: Wage growth of displaced workers in France and sample selection

A - Reemployment probit model

	(1)
Intercept	0.5408
	(0.2434)
Experience	-0.0213
	(0.0059)
ULong	0.3462
	(0.1845)
Other Layoff / Fired	-0.4737
	(0.1650)
Other Layoff / Fired * ULong	-0.5362
	(0.3412)
Other Layoff / Fired * ShortSen	0.5120
	(0.2096)
log likelihood	-342.808

B- Wage growth equation

	(2)	(3)	(4)	(5)
Intercept	0.1939	0.2074	0.2183	0.1912
	(0.0907)	(0.1139)	(0.0940)	(0.1149)
Experience	-0.0050	-0.0047	-0.0053	-0.0061
	(0.0022)	(0.0027)	(0.0022)	(0.0030)
Other Layoff / Fired			-0.0433	-0.0551
			(0.0436)	(0.0521)
Lambda		-0.0248		0.0617
		(0.1255)		(0.1499)
R^2	0.0952	0.0954	0.0995	0.1002
n	224	224	224	224

Notes: - *ULong* equals one for individuals who have been unemployed for more than 9 months at the time of the second interview $(t-1)$; *ShortSen* equals one for individuals with less than one year of seniority in their pre-displacement job. Estimates in panel B are based on Heckman's two-steps sample selection model.

Table 8: Average wage losses of displaced workers in France and the United States - net of returns to firm seniority, industry switchers only

			level of education					
			high		medium		low	
	France	US	France	US	France	US	France	US
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mass Layoff	-0.0221	-0.0909	0.0414	-0.0067	-0.0661	-0.1194	0.0281	-0.1715
	(0.0184)	(0.0265)	(0.0546)	(0.0542)	(0.0215)	(0.0331)	(0.0359)	(0.0705)
Other layoff / Fired	-0.1520	-0.1027	-0.4177	-0.0659	-0.0546	-0.1448	-0.0765	-0.0252
	(0.0268)	(0.0156)	(0.0637)	(0.0413)	(0.0317)	(0.0192)	(0.0621)	(0.0294)
R^2	0.0263	0.0218	0.0324	0.0303	0.0250	0.0239	0.0273	0.0503
n	20331	11837	5703	3543	11418	6715	3210	1579

Notes: - Industry switchers refer to displaced workers who changed one-digit industry upon re-employment; *Mass Layoff* corresponds, in the US, to worker displaced after their "company folded, changed hands, moved out of town, or employer died or went out of business" and in France to "licenciements collectifs" (i.e. more than 10 separations from a single firm); - all regressions include control for labor market experience, level of education, region of residence and year dummies; Numbers in parentheses are standard errors.

Table 9: Pre-displacement hourly wage growth of displaced workers in France and the United States relative to job stayers

			level of education					
			high		medium		low	
	France	US	France	US	France	US	France	US
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mass Layoff	0.0007	0.0192	-0.0077	0.0440	-0.0001	0.0123	0.0090	-0.0055
	(0.0085)	(0.0247)	(0.0253)	(0.0536)	(0.0103)	(0.0334)	(0.0157)	(0.0466)
Other layoff / Fired	-0.0169	-0.0167	-0.0546	-0.0080	0.0017	-0.0181	-0.0328	-0.0340
	(0.0118)	(0.0214)	(0.0315)	(0.0476)	(0.0138)	(0.0272)	(0.0249)	(0.0463)
R^2	0.013222	0.013345	0.014268	0.024863	0.013333	0.013585	0.013972	0.028887
n	21392	11946	5978	3571	11963	6785	3451	1590

Notes: - dependant variable is the change in log hourly wage rate between $t-2$ and $t-1$ for individuals who stayed on the same job between these two dates; displaced workers refer to individuals dislocated between $t-1$ and t; *Mass Layoff* corresponds, in the US, to worker displaced after their "company folded, changed hands, moved out of town, or employer died or went out of business" and in France to "licenciements collectifs" (i.e. more than 10 separations from a single firm); - all regressions include control for labor market experience, level of education, region of residence and year dummies; Numbers in parentheses are standard errors.

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