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MINIMUM WAGES AND EMPLOYMENT IN FRANCE AND THE UNITED STATES

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ABSTRACT

We use longitudinal individual wage and employment data in France and the United States to investigate the effect of changes in the real minimum wage on an individual's employment status. We find that movements in both French and American real minimum wages are associated with mild employment effects in general and very strong effects on workers employed at the minimum wage. In the French case, a 1% increase in the real minimum wage decreases the future employment probability of a man (respectively, a woman) currently employed at the minimum wage by 1.3% (1.0%). In the United States, a decrease in the real minimum wage of 1% increases the probability that a man (woman) employed at the minimum wage came from unemployment in the previous year by 0.4% (1.6%).

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1. Introduction

In this paper we examine the link between changes in the minimum wage and employment outcomes for men and women in France and the United States. We make use of longitudinal data on employment status and earnings to see how individuals are affected by real increases (in the case of France) or real decreases (in the case of the United States) in the minimum wage conditional on the individual's location in the earnings distribution. We take particular care to distinguish sub-populations that might be affected differently by the minimum wage, focusing, in particular, on low-wage workers and (in the case of France, where the data are available) on the use of employment-promotion contracts that allow the payment of sub-minimum wages.

Although little attention has been paid to the situation in Europe[1], some European countries provide interesting alternatives to the much-studied U.S. case. France, in particular, seems an ideal contrast to the United States. Whereas in the United States the nominal federal minimum wage remained constant for most states during most of the 1980s (thus implying a declining real federal minimum wage), nominal minimum wages in France rose steadily over the 1980s, as did real minimum wages. In this paper we exploit the different growth patterns in real minimum wages in a symmetric manner to better understand their effect on employment.

Most existing studies of the French minimum wage system use aggregate time-series data and find no effect of the minimum wage system on employment[2]. This could be considered surprising because, since its inception, a significant percentage of the French labor force has been employed at wages close to the minimum wage. One reason for the orientation in the empirical analyses done in France was, certainly, the tendency of American applied researchers to rely upon aggregate time series analyses[3] prior to the widespread dissemination of public use micro-economic data such as the Current Population Survey (CPS). Another reason is that research access to French micro-data was extremely limited until the 1990s. In the present study we use micro-data from France and the United States that were collected in household surveys which are quite comparable. In particular, we use longitudinal information on the workers. Consequently, we are able to analyze both French and American minimum wage systems using individual-level panel data.

Because the real minimum wage in France and the U.S. moved in opposite directions during our analysis period,[4] we have designed statistical comparisons that address the same behavior using the different variations in the national minimum wage systems to identify the

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[1] See Dolado et. al. (1996) for a summary of minimum wage studies for France, the Netherlands, Spain and the United Kingdom.

[2] See, for example, Bazen and Martin (1991).

[3] See Brown, Gilroy and Kohen (1982) for a review.

[4] We do not consider state-specific minimum wages or youth subminimum wages in the United States, which became increasingly important at the end of the 1980s. See Neumark and Wascher (1992) for an explicit treatment of this variation in the U.S. data. Similarly, we do not explicitly control for minimum wages specified by collective agreement in France that exceed the national minimum. See Margolis (1993) for a detailed treatment of the effects of the collective bargaining agreement salary grids on employment.

relevant effects. We use a statistical approach based on the analysis of employment transition probabilities conditional on the position of an individual in the wage distribution. We decompose the wage distribution into 4 regions: under, around, marginally over and over the minimum wage. Then, we exploit the size of the movements in the real minimum wage directly.[5] For France, we use the automatic and legislated increases in the nominal minimum wage that occur (at least) each July to identify groups of workers whose current wage rate will fall below the new minimum wage rate after the increase. We also identify workers whose present employment is part of a special youth program that permits wage payments below the statutory minimum. We use the limited duration of employment spells in such programs to identify a second set of minimum wage employment effects. Our statistical analysis identifies the change in future employment probabilities given an individual's minimum wage status in the present period.

We show that individuals whose reference-year real wage was between the reference-year real minimum wage and the comparison-year real minimum wage have substantially lower subsequent employment probabilities than those whose real wages were not similarly situated. This effect is particularly strong among younger workers. The conditional elasticity of subsequent employment as a function of the real minimum wage for young male French workers in this situation, evaluated at sample means, is -3.2 for 26-30 year olds and -4.3 for 31-35 year olds. This effect is present even when unobserved labor market heterogeneity and labor supply behavior are partially controlled by the inclusion of a separate category for workers marginally over the minimum wage. However, the impact of the minimum wage decreases with age.

For the United States we use the constancy of the nominal minimum wage between 1981 and 1987 to identify groups of employed workers whose real wage in a given period would have been below the real minimum wage in the previous period. We show that young men whose real wages were between the two real minimum wages, as described above, had lower employment probabilities in the previous period than individuals whose real wages were not. The conditional elasticity, evaluated at sample means, is -1.6 for 26-30 year olds and -2.3 for 31-35 year olds. For women, these effects, favoring employment of persons that were previously not employed, are present at all ages.

The paper is structured as follows. Section 2 provides some institutional background on the systems of minimum wages in both France and the United States, and provides some preliminary indications of the potential impact in each case based on empirical wage distributions. Section 3 describes the data that we used to analyze the impact of minimum wages, and section 4 lays out the statistical models used to evaluate the employment effects of minimum wage changes. Section 5 details our conditional logit analyses. Section 6 concludes.

2. Institutional Background

2.1 France

The first minimum wage law in France was enacted in 1950, creating a guaranteed hourly wage rate that was partially indexed to the rate of increase in consumer prices. Beginning in 1970, the original minimum wage law was replaced by the current system, called the SMIC "Salaire Minimum Interprofessionnel de Croissance," linking the changes in the minimum wage to both

[5] Our analysis bears some resemblance to that of Linneman (1982).

consumer price inflation and growth in the hourly blue-collar wage rate. In addition to formula-based increases in the SMIC, the government also legislated increases many times over the next two decades. The statutory minimum wage in France regulates the hourly regular cash compensation received by an employee, including the employee's part of any payroll taxes[6].

Figure 1 shows the time series for the nominal French minimum wage and the associated employee-paid and employer-paid payroll taxes. Because of the extensive use of payroll taxes to finance mandatory employee benefits, by the 1980s the French minimum wage imposed a substantially greater cost upon the employer than its statutory value. Employees share in the legal allocation of the payroll taxes, as the figure shows; however, low wage workers benefit substantially more than the average worker from social security benefits financed through these taxes. In general, the payroll taxes are proportional to employee's gross salary; however, the social programs—particularly, unemployment insurance, health care, retirement income and employment programs—benefit low wage workers substantially more (Abowd and Bognanno, 1995). Appendix Table A provides a complete statistical history of the real and nominal SMIC, including employer and employee payroll tax components.

[6] In theory, there are no provisions in any of the minimum wage laws that would allow regional variation in the SMIC. In some sectors in the French economy, however, the effective minimum wage was determined by collective bargaining agreements. Because they were often extended by the Minister of Labor to include employers who were not party to the original negotiations, these agreements typically covered entire regions and industries. Although relatively important in the 1970s, these provisions became increasingly irrelevant during the 1980s (our period of analysis) since the collectively bargained nominal salary grids remained fixed in the face of an increasing nominal SMIC.

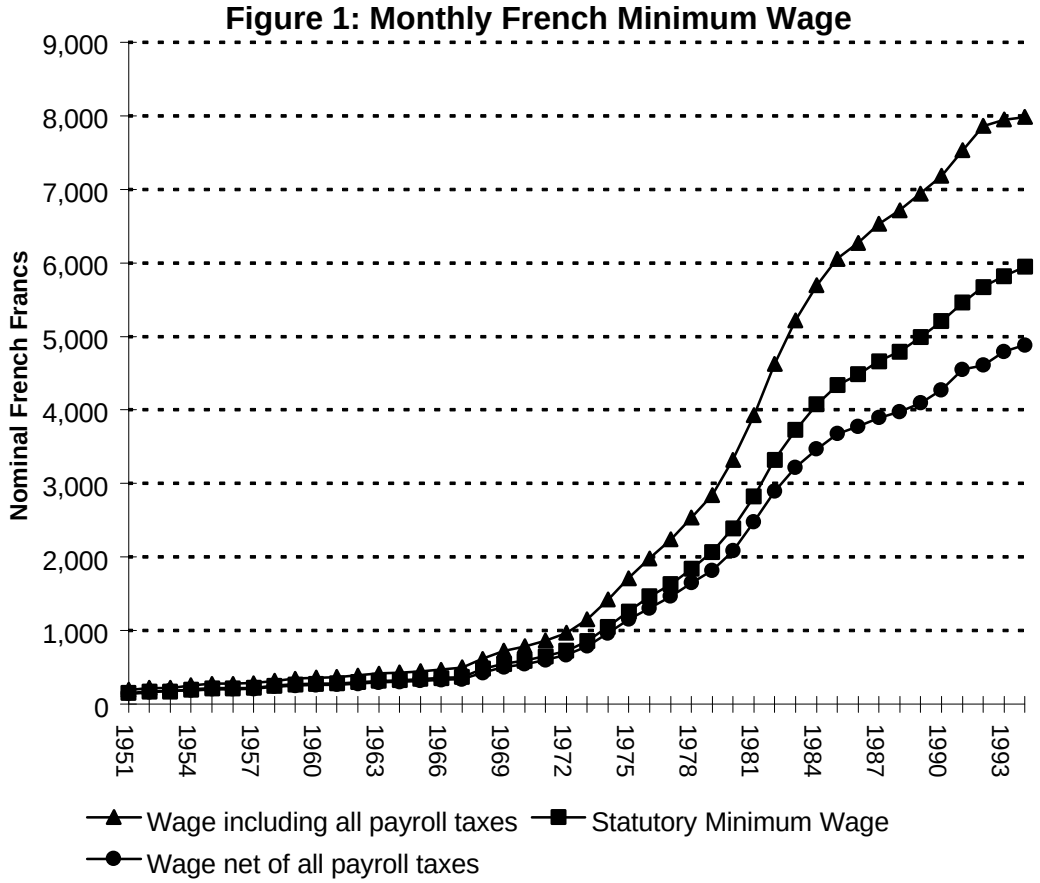
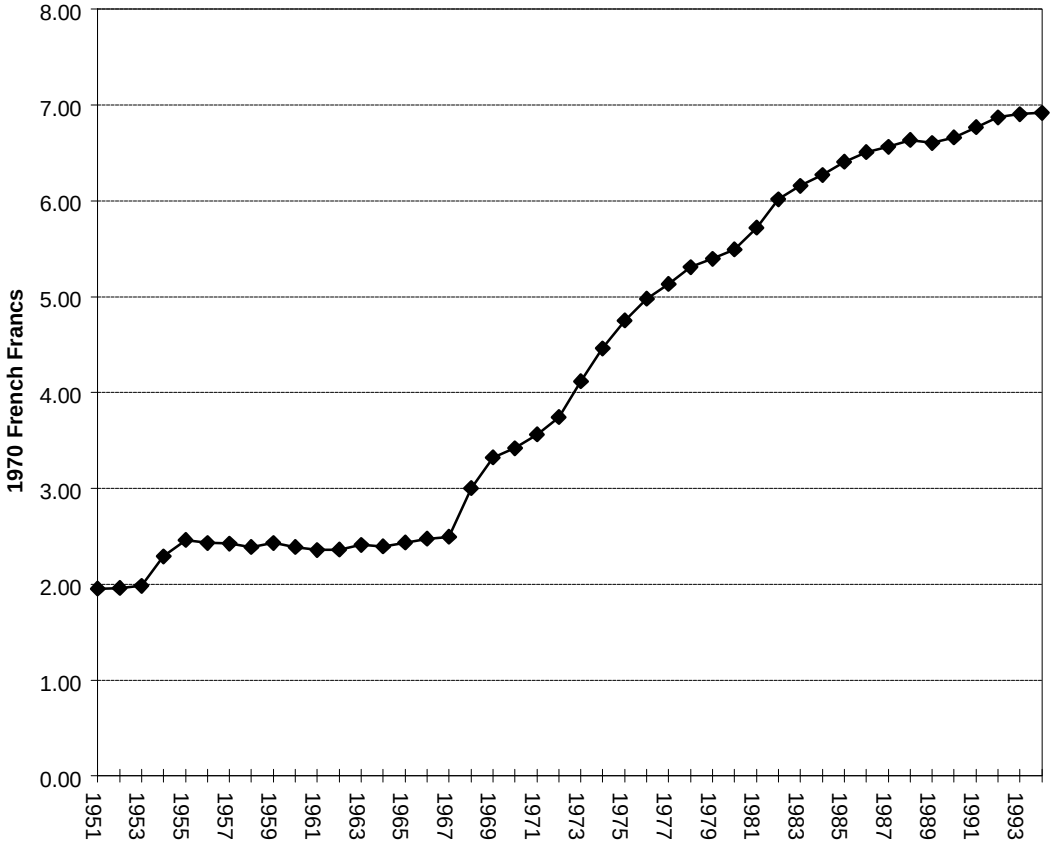


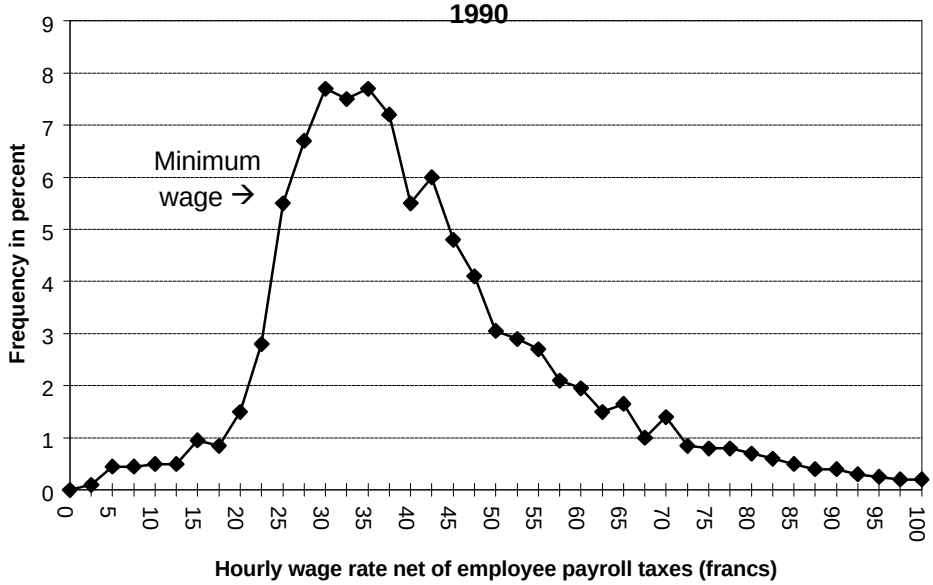
Figure 2 shows the hourly real French minimum wage from 1950 to 1994. Even though the original French minimum wage program, called the SMIG "Salaire Minimum Interprofessionnel Garanti," was only partially indexed, the real minimum wage did not decline measurably over the entire post-war period and increased substantially during most decades.

Figure 2: Real Hourly Minimum Wage (France)



The French minimum wage lies near most of the mass of the wage rate distribution for the employed work force. To show the location of the SMIC in this distribution, we plotted the empirical distribution of hourly wage rates for 1990, the earliest year for which the Labor Force Survey reports continuous wage data. Figure 3 shows these data. We have indicated the SMIC directly on the figure. Notice that the first mode of the wage distribution is within five francs of the minimum wage and the second mode is within 10 francs of the minimum. In the overall distribution, 13.6% of the wage earners lie at or below the minimum wage and an additional 14.4% lie within an additional 5F per hour of the SMIC.

Figure 3: Empirical Distribution of Hourly Wages in France 1990



Dolado et. al. (1996) discuss the incidence of the SMIC with respect to household income. They find that, although people employed at the SMIC do tend to be in the poorest households, the distribution of "smicards" (people paid the SMIC) is not monotonically decreasing in household income. For example, they find that the share of individuals paid the SMIC in each decile of household income increases from 10.1% in the lowest decile to 13.1% in the 3rd lowest decile, then decreases to 6.6% for the 5th decile, increasing to 7.4% for the 6th decile and then declining monotonically to 0.6% in the highest decile of household income.

2.2 United States

The first national minimum wage in the United States was a part of the original Fair Labor Standards Act (FLSA) of 1938. The American national minimum wage has never been indexed and increases only when legislative changes are enacted. The national minimum applies only to workers covered by the FLSA, whose coverage has been extended over the years to include most jobs. The statutory minimum wage regulates the hourly regular cash compensation received by an employee including the employee's part of any payroll taxes.

Figures 4 and 5 show the distribution of the American hourly wage rate and the location of the minimum wage in that distribution for 1981 and 1987, the beginning and ending year of our analyses[7]. For 1981, 17.7% of the employed work force had wage rates at or below the minimum wage and an additional 14.6% had wage rates within an additional $1.00 per hour of the minimum. For 1987, only 9.5% of employed persons have hourly wage rates at or below the minimum while an additional 9.9% lie within the next $1.00 per hour.

[7] It should be noted that the federal minimum wage was increased to $3.35/hour in 1980.

Figure 4: Empirical Distribution of Hourly Wages in the U.S. 1981

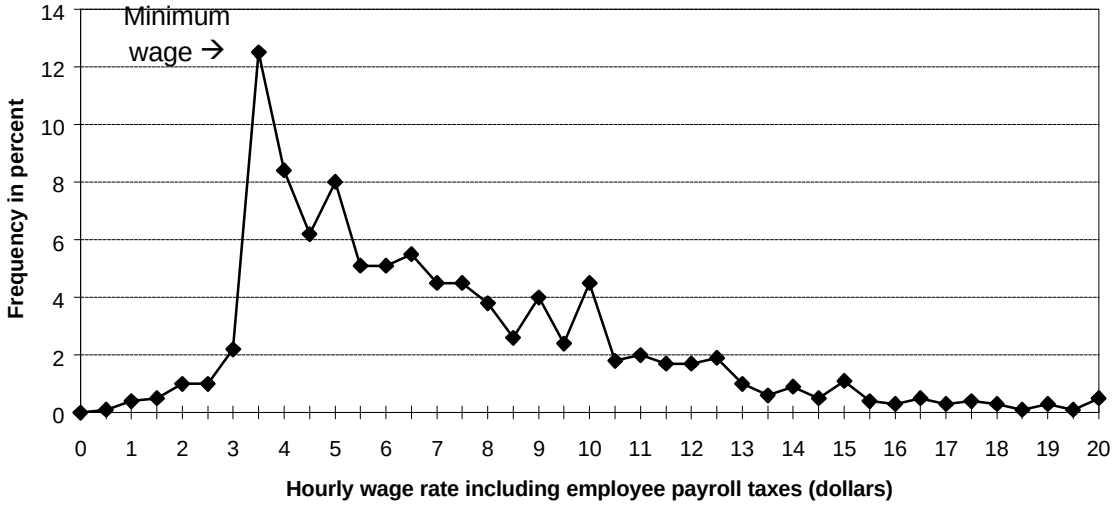
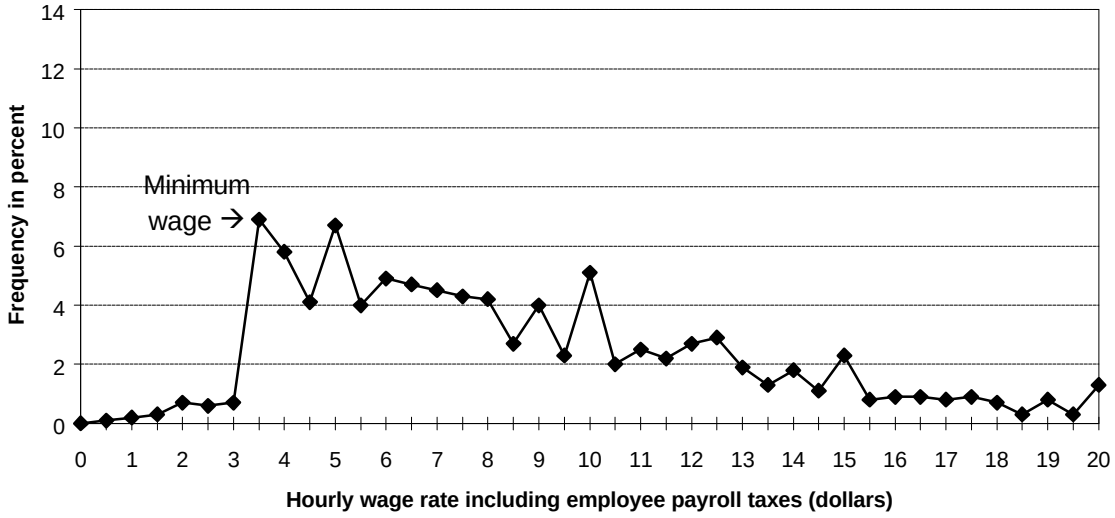


Figure 5: Empirical Distribution of Hourly Wages in the U.S. 1987



3. Data Description

3.a. France

The French data were extracted from the "Enquête Emploi" (Labor Force Survey) for the years 1981 to 1989. The sixty thousand households included in the Labor Force Survey sample were interviewed in March of three consecutive years with one-third of the households replaced each year. The longitudinal design of the French Labor Force Survey is based on the domicile address and not on the household composition. Individuals who were interviewed in the first wave were reinterviewed in subsequent waves unless they had moved out of the originally

sampled domicile. Our longitudinal analysis used any individual for whom pairwise consecutive yearly observations were available. We used the INSEE research files for each of the indicated years. These files include the identifiers that allow us to follow individuals from year to year. Using these identifiers, we created year-to-year matched files for the years 1981-82 to 1988-89.

The survey measures usual monthly earnings, net of employee payroll taxes but including employee income taxes, and usual weekly hours. Usual monthly earnings is measured in 20 intervals of widths varying from 500F to 5,000F. It is important to note that the narrowest intervals were used for the lowest salaries. Since minimum wages are defined on an hourly basis, we constructed an hourly wage measure as $w_t = \frac{sal_t}{hours_t}\frac{12}{52}$, where sal_t is the midpoint of the declared monthly earnings category and $hours_t$ represents usual weekly hours, both corresponding to year *t*.

Certain young workers were employed in publicly-funded programs that either combined classroom education with work ("apprentis", "stage de qualification" or "stage d'insertion, contrat emploi-formation") or provide subsidized low-wage employment ("TUC, travaux d'utilité collective" or "SIVP, stage d'initiation à la vie professionnelle" both from 1985 to 1989). All of these programs provide a legal exemption from the SMIC and from certain payroll taxes. Most of these programs are limited to workers 25 years old and under.

The employment status in year *t* is equal to one for all individuals who are employed in March of the survey year, and equal to 0 otherwise. The French Labor Force Survey definition of employment is the same as the one used by the International Labor Office: a person is employed if he or she worked for pay for at least one hour during the reference week. The definition is thus consistent with the American BLS definition used below.

Our control variables consisted of education, potential labor force experience, seniority, region of France, date of labor force entry and year. Education was constructed as eight categories: none, completed elementary school, completed junior high school, completed basic vocational/technical school, completed advanced vocational/technical school, completed high school (baccalauréat), completed technical college or undergraduate university, and completed graduate school or post-college professional school. Potential labor force experience was computed as the difference between current age and age at school exit. Seniority was measured as the response to a direct question on the survey (years with the present employer). Region is an indicator variable for the "Ile de France" (Paris metropolitan area) as the region of residence. In all of our analyses we also control for the real hourly wage rate in the analysis period.

The SMIC data were taken from Bayet (1994), which reports official INSEE statistics. We selected the hourly SMIC for March of the indicated year, net of employee payroll taxes.

3.b. United States

We used the NBER extracts of the outgoing rotation group files from the Current Population Survey for the years 1981 to 1987. We applied the U.S. Census Bureau matching algorithm to create year-to-year linked files for the years 1981-82 to 1986-87.

The outgoing rotation groups (households being interviewed for the fourth or eighth time in the CPS rotation schedule) are asked to report the usual weekly wage and usual weekly hours. Individuals who normally are paid by the hour were asked to report that wage rate directly. We created an hourly wage rate using the directly reported hourly wage rate, when available, and the ratio of usual weekly earnings to usual weekly hours, otherwise. Respondents are asked to report these wage measures gross of employee payroll taxes, so they are not directly comparable to the

measures constructed from the French data, which are reported net of employee payroll taxes. We created real hourly wage rates by dividing by the 1982-84-based Consumer Price Index for all Urban Workers for the appropriate month.

We created a second set of hourly wage measures for the United States that included income from tips in the hourly wage. To do this we computed the second hourly wage rate as usual weekly earnings divided by usual weekly hours for workers who reported that they were paid by the hour. When this second hourly wage rate exceeded the one directly reported, we used the computed measure. This measure of hourly wage rate is referred to as "including income from tips."

An individual is employed in year *t* if he or she worked at least one hour for pay during the second week of the survey month. We used the CPS employment status recode variable to determine employment. The BLS definition is thus consistent with the one used in the French Labor Force Survey.

Our control variables consist of education, potential labor force experience, race, marital status and region. Education was constructed as the number of years required to reach the highest grade completed. Potential labor force experience is age minus years of education minus five. Race is one for nonwhite individuals. Marital status is one for married persons. Region is a set of three indicator variables for the northeast, north-central and southern parts of the U.S. In all of our analyses we also control for the real hourly wage rate in the analysis period.

The U.S. national nominal minimum wage was $3.35 throughout our analysis period.

3.c. Conditional Transition Probabilities

A preliminary analysis of the empirical transition probabilities of workers into or out of employment based on their positions in the wage distribution relative to the minimum wage suggests that one might expect to see significant impacts of the minimum wage on employment probabilities in both France and the United States. In the case of France, we study the probability that an individual is employed at the date *t+1* given the person's wage rate relative to the SMIC at date *t*. In the case of the United States, the question is whether or not an individual was employed at date *t* given the wage rate relative to the minimum at date *t+1*.

Let miw_t be the nominal hourly minimum wage in year *t*, $rmiw_t$ be the real hourly minimum wage in year *t* and h_t represent the number of monthly hours worked in the sample month in year *t*. Let w_t be the individual's nominal hourly wage rate in year *t* and rw_t be the real hourly wage for year *t*. All hourly individual and minimum wage rates are defined net of the employee's share of payroll taxes for both countries regardless of the original measurement units.

Then, we define the following 4 departure (occupied at date *t*) states:

- Employed at *t* and paid under the SMIC $\left(\mathrm{I}\left(rw_t < rmiw_t\right)=1\right)$
- Employed at *t* and paid between the SMIC at date *t* and the SMIC at date *t+1* $\left(\mathrm{I}\left(rmiw_t \le rw_t < rmiw_{t+1}\right)=1\right)$
- Employed at *t* and paid a wage at date *t* that is marginally above the SMIC at date *t+1* $\left(\mathrm{I}\left(rmiw_{t+1} \le rw_t < 1.15\times rmiw_{t+1}\right)=1\right)$
- Employed at *t* and paid a wage at date *t* that is well above the SMIC at date *t+1* $\left(\mathrm{I}\left(1.15\times rmiw_{t+1} \le rw_t\right)=1\right)$

where I(.) is the indicator function taking the value 1 when the condition is true and 0 otherwise. We also define two arrival (occupied at date *t+1*) states:

- Employed at *t+1*
- Not Employed at *t+1*.

For the United States, recall that the nominal minimum wage was constant over the entire sample period at $3.35 per hour. Let $rmarg_t$ be the real value of $4.00 per hour at date *t*. Thus we construct the 4 departure states as:[8]

- Employed at *t+1* and paid less than the real minimum wage at date *t+1* $\left(\mathrm{I}(rw_{t+1} < rmiw_{t+1}) = 1\right)$
- Employed at *t+1* and paid between the real minimum wage at date *t+1* and the real minimum wage at date *t* $\left(\mathrm{I}(rmiw_{t+1} \le rw_{t+1} < rmiw_t) = 1\right)$
- Employed at *t+1* and paid marginally above the real minimum wage at date *t* $\left(\mathrm{I}(rmiw_t \le rw_{t+1} < rmarg_t) = 1\right)$
- Employed at *t* and paid well above the minimum wage $\left(\mathrm{I}(rmarg_t \le rw_{t+1}) = 1\right)$.

We define the two arrival states as:

- Employed at *t*
- Not Employed at *t*.

Table 1 describes the unconditional probability of employment during the comparison year over the sample period for the French and the American workers who are paid at the minimum or marginally above the minimum in the reference year. Thus the table shows the probability of being employed at date *t+1* for groups defined by their wage relative to the minimum at date *t* in France. Similarly, Table 1 considers the employment probability at date *t* for groups defined by their wage relative to the minimum at date *t+1* for the United States. The statistics are decomposed by age and sex in both countries.

[8] We remind the reader that the U.S. analysis is conducted predicting the employment state in period *t* given the state in *t+1*; thus, the *t+1* state is the departure state.

Table 1
Cell Sizes and Transition Probabilities

Age Category	France				United States			
	Men		Women		Men		Women	
	Cell Size	$P(emp_{t+1}=1)$	Cell Size	$P(emp_{t+1}=1)$	Cell Size	$P(emp_t=1)$	Cell Size	$P(emp_t=1)$
Between the Two Minima								
16-20	161	0.6894	153	0.8693	2942	0.7226	3441	0.6010
21-25	231	0.8442	295	0.8475	842	0.7518	1325	0.6091
26-30	102	0.8824	197	0.8629	262	0.7176	777	0.5997
31-35	74	0.8514	158	0.9051	167	0.7485	669	0.6383
36-40	53	0.9434	131	0.9313	94	0.8191	531	0.6026
41-45	54	0.8704	88	0.8409	97	0.7113	466	0.6545
46-50	57	0.9474	108	0.8889	96	0.7500	429	0.6993
56-55	68	0.8382	103	0.8544	86	0.7442	421	0.6817
56-60	48	0.6250	52	0.7885	111	0.7658	382	0.7592
Marginally Over the Minimum								
16-20	577	0.7123	460	0.8804	3184	0.7670	3169	0.6412
21-25	1424	0.8968	1354	0.9010	1618	0.7676	2099	0.6665
26-30	916	0.9345	980	0.8990	622	0.7749	1445	0.6858
31-35	694	0.9179	922	0.9284	376	0.7979	1348	0.6773
36-40	543	0.9079	778	0.9254	211	0.7678	1235	0.6988
41-45	405	0.9235	634	0.9306	222	0.7793	993	0.7251
46-50	480	0.9146	727	0.9243	149	0.7450	943	0.7370
56-55	450	0.8756	612	0.9020	191	0.7592	809	0.7602
56-60	299	0.7358	340	0.8147	223	0.8027	771	0.7536

By comparing workers paid at the minimum with those paid marginally above the minimum, we obtain our first indication that the minimum wage has an impact on employment. For practically all age categories and both sexes, workers employed at the minimum in the reference year are less likely to be employed in the comparison year than workers employed marginally above the minimum in the reference year. The comparison is relevant in that workers employed between the two minima are directly affected by movements in the minimum wage, whereas the effects on those employed marginally above the minimum are indirect at best, *ceteris paribus*.

It is also important to note that the symmetric, yet opposite, movements of the real minimum wage rates in the two countries have similar implications for a competitive view of labor markets. In France, either the value of marginal product (VMP) for "between" workers increases, or they will be unemployable in the following period. In the United States, "between" workers have a VMP that was too low to make their employment profitable at date *t*, but the decreasing real minimum wage opened up opportunities to legally employ them and pay them their VMP. In neither country will movements in the minimum wage directly affect workers paid marginally above the minimum wage rate.

Clearly, this descriptive analysis is not sufficient to discredit the hypothesis that low wage workers are, in some way, qualitatively different from high wage workers. To separate out this effect, we need to control for worker characteristics[9] in order to analyze more thoroughly the transitions between employment and nonemployment.

[9] There remains a possibility that unobserved worker heterogeneity might bias our results in section 5. Unfortunately, there is no easy way to control for unobserved heterogeneity in this context. Indeed, we suppose that the inclusion of the "marginally above" the minimum wage group is sufficient to capture any heterogeneity in

4. Minimum Wage Effects on Employment: Conditional Logit Analysis

In order to control for the impact that variables, including the minimum wage and its movements, might have on labor market transitions, we applied the following statistical technique. As in the previous section, we exploit the size of changes in the real minimum wage rate to categorize workers as "between" old and new values of the real minimum wage (i.e. with an hourly real wage rate lying between the old and the new real minimum wage). We use a conditional logit analysis of subsequent (or prior) employment probabilities to see if workers who might be directly affected by real minimum wage changes have significantly different subsequent (or prior) employment probabilities.

Once again, let $rmiw_t$ be the real hourly minimum wage rate in year t and let rw_t be the real hourly wage rate for year t, both net of employee payroll taxes. Let age_t represent an individual's age at the date t and $stage_t$ indicate that the person was employed under some employment promotion contract that allows for sub-minimum wages in year t. Finally, let e_t indicate the individual's employment status (employed=1) in year t.

We define a person as "between" in France if the mean of the cell in which the person is located at the date t is at or above the minimum wage at date t but below the minimum wage (in date t francs) at date $t+1$. Algebraically, after defining rw_t to be the mean of the cell in which the individual is located and use the condition

$$\mathrm{I}\left(rmiw_t \le rw_t \le rmiw_{t+1}\right) = 1.$$

We also break up the sub-minimum population (those for whom $rw_t < rmiw_t$) into two groups in France: those on employment-promotion contracts ($stage_t$) and those not on employment-promotion contracts. Thus, for France, we estimate variants of the following equation for individuals:

$$\Pr\left[e_{t+1}=1 \middle| e_t=1\right] = \mathrm{F}\begin{pmatrix} x_t b + a_1 \mathrm{I}\left(rw_t < rmiw_t\right) \times stage_t \times \left(rmiw_{t+1} - rmiw_t\right) \\ + a_2 \mathrm{I}\left(rw_t < rmiw_t\right) \times \left(1 - stage_t\right) \times \left(rmiw_{t+1} - rmiw_t\right) \\ + a_3 \mathrm{I}\left(rmiw_t \le rw_t \le rmiw_{t+1}\right) \times \left(rmiw_{t+1} - rmiw_t\right) \times age_t \\ + a_4 \mathrm{I}\left(rmiw_{t+1} < rw_t \le (rmiw_{t+1} \times 1.15)\right) \times \left(rmiw_{t+1} - rmiw_t\right) \times age_t \end{pmatrix} \quad (1)$$

where $\mathrm{F}(\cdot)$ is the standard logistic distribution function. The logit described in equation (1) allows us to test the hypothesis, implied by the theory of competitive labor markets, that if marginal productivity stays constant, increases in the real minimum wage render previously employed individuals, whose wages fall in between the old and new minima, currently unemployable. In

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transition rates that is correlated with wages. In addition, we always control for the actual real wage rate in the appropriate period.

particular, this specification also allows us to see if the effects of the minimum wage vary with age. [10]

We define a person as "between" in the United States if the person's real hourly wage at the date *t+1* is at or above the minimum wage at date *t+1* but below the minimum wage (in date *t+1* dollars) at date *t*. Algebraically, this is equivalent to

$$\mathrm{I}\left(rmiw_{t+1} \le rw_{t+1} \le rmiw_t\right) = 1 .$$

We also define the variable $rmarg_t$ as the deflated value of \$4.00 at date *t*. Thus for the United States, we estimate variants of the following equation:

$$\Pr\left[e_t = 1 \middle| e_{t+1} = 1\right] = F\left(\begin{array}{l} x_t b + a_1 \mathrm{I}\left(rw_{t+1} < rmiw_{t+1}\right) \times \left(rmiw_t - rmiw_{t+1}\right) \times age_t \\ + a_2 \mathrm{I}\left(rmiw_{t+1} \le rw_{t+1} \le rmiw_t\right) \times \left(rmiw_t - rmiw_{t+1}\right) \times age_t \\ + a_3 \mathrm{I}\left(rmiw_t < rw_{t+1} \le rmarg_t\right) \times \left(rmiw_t - rmiw_{t+1}\right) \times age_t \end{array}\right) \qquad (2)$$

The interpretation of equation (2) is symmetric to that of equation (1). Does a relatively large decrease in the real minimum wage allow previously unemployable individuals to be employed? Furthermore, in the United States, we explicitly examine the impact that tips might have on our measure of the position of a person in the wage distribution. However, since our wage measure that excludes tips uses reported rather than constructed data[11], the focus of our analysis in section 5 is on the no-tips wage measure[12].

Notice that the equations for the U.S. have empirical content because the nominal minimum wage rate does not change during our sample period whereas the real minimum wage rate declines because of general price inflation. In contrast, the equations for France have empirical content because the indexation formula is tied to general price inflation and to the growth in average hourly earnings among blue-collar workers, and as noted in section 2.1, real minimum wages increased steadily throughout the sample period[13].

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[10] We experimented with different forms of age aggregation in order to evaluate particular labor market phenomena such as the end of eligibility for employment promotion contracts or mandatory military service. Our results are not sensitive to the age categories shown in the tables.

[11] Welch (1997) provides evidence on various sorts of measurement error in the Current Population Survey, and hints that hours are likely to be a greater source of measurement error than wages.

[12] We report our results based on the wage measure that includes tips in appendix B.

[13] Our conditional logit estimates are performed on the set of individuals who are employed at some point in the sample. Thus the coefficients should not necessarily be interpreted as representative of the entire potential labor force, but rather as appropriate for the sample of workers who satisfy the selection criterion.

5. Conditional Logit Results

5.a. France

Table 2 shows the results of estimating equation (1) for France separately for men and women, using broad age categories. We report only the coefficients on the key real minimum wage variables, although many other control variables were included in the regressions[14].

The coefficients show that French men aged 21-25, 26-30, and 31-35 with real wage rates in period *t* that are between the real minima in *t* and *t+1* have much lower subsequent employment probabilities than men paid real wages in period *t* that are marginally above the period *t+1* real minimum wage. The elasticities are quite large: an increase of 1% in the real minimum wage entails a decrease in the probability of remaining employed of approximately 1.4% (resp. 3.2% and 4.3%), relative to men aged 21-25 (resp. 26-30 and 31-35) who are paid marginally above the minimum.[15] Older men (36 and above) paid around the minimum do not seem to be more affected by minimum wage increases than similar men paid marginally above. Aggregated over all age groups, an increase of 1% in the real minimum wage entails a decrease in the probability of remaining employed of 1.29%, for male workers in the appropriate at risk group (real wage rates in *t* that are between the *t* and *t+1* real minima). One interpretation of these results is that although low-wage workers do differ from high wage workers (as the fairly consistent negative coefficients suggest), the minimum wage hits young French men whose real wages are between the two minima much harder than other low wage workers.

[14] In addition to demographic variables (the complete list of which appears in the notes to the tables), we also included measures of the type of employment contract. In particular, we explicitly distinguish between fixed duration contracts (contrats à durée déterminée, CDD), youth employment schemes (young stagiaire), and apprenticeships, with the reference group being long term contracts (contrats à durée déterminée, CDI). See Abowd, Corbel, and Kramarz (1999) for details on the importance of distinguishing between CDDs and CDIs.

[15] It should be noted that, due to the relatively small cell sizes (see table 1), the differences in coefficients among the "between" and "marginally above" workers are only occasionally statistically significant. Appendix table C shows the differences in coefficients and their standard errors. Nevertheless, the consistent sign and magnitude of the differences suggests the presence of an economically important phenomenon.

Table 2
Estimated Effect of Real French Minimum Wage Increases
On Subsequent Employment Probabilities - Detailed Age Categories

Name of effect	Coefficient	Standard Error	P-Value	Elasticity
A. Men, hourly wage				
$16 \leq Age_t \leq 20$	8.9618	2.7304	0.0010	3.0535
$21 \leq Age_t \leq 25$	19.3665	2.1802	0.0001	1.4376
$26 \leq Age_t \leq 30$	16.3522	2.2665	0.0001	0.5974
$31 \leq Age_t \leq 35$	14.4636	2.3528	0.0001	0.4353
$36 \leq Age_t \leq 40$	16.3136	2.5620	0.0001	0.4457
$41 \leq Age_t \leq 45$	18.2648	2.6125	0.0001	0.5224
$46 \leq Age_t \leq 50$	22.0395	2.3699	0.0001	0.8017
$51 \leq Age_t \leq 55$	9.3443	1.8993	0.0001	1.0101
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(16 \leq Age_t \leq 20)$	-7.5492	7.7608	0.3307	-2.3445
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(21 \leq Age_t \leq 25)$	-15.0196	8.3891	0.0734	-2.3407
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(26 \leq Age_t \leq 30)$	-33.7128	11.4511	0.0032	-3.9662
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(31 \leq Age_t \leq 35)$	-34.9743	15.5535	0.0245	-5.1989
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(36 \leq Age_t \leq 40)$	-8.5172	25.6534	0.7399	-0.4821
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(41 \leq Age_t \leq 45)$	-18.5268	16.5751	0.2637	-2.4016
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(46 \leq Age_t \leq 50)$	26.4611	27.0334	0.3277	1.3927
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(51 \leq Age_t \leq 55)$	10.9252	15.0434	0.4677	1.7673
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(16 \leq Age_t \leq 20)$	-0.8342	3.7453	0.8237	-0.2400
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(21 \leq Age_t \leq 25)$	-8.9479	3.3443	0.0075	-0.9237
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(26 \leq Age_t \leq 30)$	-11.4209	5.0211	0.0229	-0.7481
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(31 \leq Age_t \leq 35)$	-10.9114	6.0231	0.0701	-0.8962
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(36 \leq Age_t \leq 40)$	-14.5228	6.6566	0.0291	-1.3373
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(41 \leq Age_t \leq 45)$	-1.8726	7.4896	0.8026	-0.1433
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(46 \leq Age_t \leq 50)$	-0.3603	6.2610	0.9541	-0.0308
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(51 \leq Age_t \leq 55)$	13.6077	4.9606	0.0061	1.6934

Source: French Labor Force Survey, 1981-89, matched year to year.

Notes: Equations estimated by maximum likelihood logit. All equations include indicators for year, education (8 groups), region (Ile de France), age (8 groups), fixed term contract, young stagiaire, apprentice, paid under the SMIC and young stagiaire and paid under the SMIC and not young stagiaire, as well as the continuous variables labor force experience (through quartic), seniority, seniority squared and hourly wage in year t (through cubic). All displayed coefficients are equal to the indicated group multiplied by the real percentage increase in the SMIC between year t and t+1 (1981=100). The coefficients and elasticities show the partial effects on the probability of employment in year t+1, given employment in year t. Only people aged 16-60 years old were considered. Sample size is 103,893.

Table 2 (continued)
Estimated Effect of Real French Minimum Wage Increases
On Subsequent Employment Probabilities - Detailed Age Categories

Name of effect	Coefficient	Standard Error	P-Value	Elasticity
B. Women, hourly wage				
$16 \leq Age_t \leq 20$	16.9146	3.8462	0.0001	3.0692
$21 \leq Age_t \leq 25$	15.9104	2.5178	0.0001	1.4622
$26 \leq Age_t \leq 30$	13.6156	2.4542	0.0001	0.9190
$31 \leq Age_t \leq 35$	15.0055	2.5587	0.0001	0.7641
$36 \leq Age_t \leq 40$	16.2339	2.8474	0.0001	0.6999
$41 \leq Age_t \leq 45$	8.2563	2.8771	0.0041	0.4352
$46 \leq Age_t \leq 50$	16.2562	2.9226	0.0001	0.8718
$51 \leq Age_t \leq 55$	11.6159	2.5352	0.0001	1.1256
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(16 \leq Age_t \leq 20)$	-0.1906	9.4827	0.9840	-0.0249
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(21 \leq Age_t \leq 25)$	-17.6620	6.7599	0.0090	-2.6942
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(26 \leq Age_t \leq 30)$	-21.6794	8.1511	0.0078	-2.9713
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(31 \leq Age_t \leq 35)$	-11.8064	11.8761	0.3202	-1.1209
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(36 \leq Age_t \leq 40)$	-3.4636	14.0054	0.8047	-0.2380
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(41 \leq Age_t \leq 45)$	-20.1718	10.2238	0.0485	-3.2091
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(46 \leq Age_t \leq 50)$	-4.7538	11.9464	0.6907	-0.5282
$(Real\ SMIC_t \leq Real\ Wage_t \leq Real\ SMIC_{t+1})*(51 \leq Age_t \leq 55)$	-4.5943	9.8911	0.6423	-0.6691
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(16 \leq Age_t \leq 20)$	1.0815	5.1320	0.8331	0.1293
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(21 \leq Age_t \leq 25)$	-6.5726	3.2759	0.0448	-0.6505
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(26 \leq Age_t \leq 30)$	-3.9517	4.0511	0.3293	-0.3992
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(31 \leq Age_t \leq 35)$	-1.0531	4.7761	0.8255	-0.0754
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(36 \leq Age_t \leq 40)$	-6.1224	5.3456	0.2521	-0.4564
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(41 \leq Age_t \leq 45)$	8.4310	5.8332	0.1484	0.5851
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(46 \leq Age_t \leq 50)$	-2.2374	5.1996	0.6670	-0.1693
$(Real\ SMIC_{t+1} \leq Real\ Wage_t \leq (1.15*Real\ SMIC_{t+1}))*(51 \leq Age_t \leq 55)$	1.8236	4.6858	0.6971	0.1788

Source: French Labor Force Survey, 1981-89, matched year to year.

Notes: Equations estimated by maximum likelihood logit. All equations include indicators for year, education (8 groups), region (Ile de France), age (8 groups), fixed term contract, young stagiaire, apprentice, paid under the SMIC and young stagiaire and paid under the SMIC and not young stagiaire, as well as the continuous variables labor force experience (through quartic), seniority, seniority squared and hourly wage in year t (through cubic). All displayed coefficients are equal to the indicated group multiplied by the real percentage increase in the SMIC between year t and t+1 (1981=100). The coefficients and elasticities show the partial effects on the probability of employment in year t+1, given employment in year t. Only people aged 16-60 years old were considered. Sample size is 80,490.

Similar results hold for French women, the implied conditional elasticity aggregated over all age groups implies that a 1% increase in the real minimum wage rate entails a decrease in the reemployment probability for female French workers paid around the minimum of 0.97% (as compared to workers paid marginally above the minimum). There are important negative employment effects for most age groups in the 16-35 year old categories, Furthermore, it is interesting to note that a large difference in elasticities also appears for women aged 41-45. Not coincidentally, this corresponds to the age at which many women reenter the labor force after

having withdrawn to raise children. Thus, this difference could be reflecting a delayed version of the minimum wage effect already observed for younger women.

In other related work that focused specifically on the youth labor market[16], we found that all of the types of employment contracts studied here tend to lead to more precarious labor force attachment than an indefinite term contract, but the employment promotion contracts (young stagiaires) seem to provide relative security for the subminimum population[17]. Looking at these populations in more detail, we found that 25-year old French men whose wages were between the two minima and who would no longer be eligible for employment promotion contracts the following year because of their age were dramatically affected by the minimum wage increases. The elasticity of -15.9 (expressed as a difference from the "marginally above" category), and the subsequent negative coefficients for "between" men are consistent with the idea that the minimum wage has a strong negative impact on subsequent employment probabilities for this very small group. In addition, the presence of employment promotion contracts, and the reduction in employer payroll taxes that they imply, helps workers who are under 25 to find new jobs within the year when faced with a steadily increasing real SMIC. However, when workers are no longer eligible for such contracts, their probability of being out of a job the following year increases dramatically. This supports the hypothesis that "between" workers who are eligible for employment promotion contracts are shielded from the negative effects of movements in the SMIC, but "older" young workers are not. More precisely, it suggests that the reason why there seems to be some evidence of a difference among the "between" and "marginally above" workers in the 21-25 age group is because of the inclusion of 25 year-olds in the group.

In addition to estimating our conditional logits with "marginally above" the SMIC defined as 1.15 times the SMIC, we also estimated these models with two alternative definitions of "marginally above" (1.10 and 1.20 times the SMIC). Table 3 analyzes the robustness of the coefficients for the "between" and "marginally above" categories to these changes in the definition of "marginally above". Overall, it seems that our results are robust to changes in the definition of "marginal".

[16] See Abowd, Kramarz, Lemieux, and Margolis (1998).

[17] See also Bonnal, Fougère, and Sérandon (1997) for an analysis of the impact of the youth employment schemes on employment histories.

Table 3
Robustness of Conditional Logit Results to Variations in the Definition of "Marginally Over the Minimum"

	Narrow		Medium		Wide	
	Between	Marginally Over	Between	Marginally Over	Between	Marginally Over
FRANCE						
Men	-10.1034	-4.2497	-10.7088	-5.0710	-11.4736	-5.0253
	(0.8110)	(0.4725)	(0.8185)	(0.2848)	(0.8491)	(0.3601)
Women	-10.2024	-0.3734	-10.4226	-1.2055	-10.8823	-2.3282
	(0.6274)	(0.4137)	(0.6334)	(0.2404)	(0.6722)	(0.2870)
UNITED STATES						
Without Tips						
Men	-3.7279	-1.0940	-5.1535	-3.7957	-5.2996	-3.5492
	(1.1264)	(1.2960)	(1.2485)	(1.0898)	(1.3139)	(1.0580)
Women	-6.5302	-5.4114	-7.6003	-5.2458	-7.8009	-4.5091
	(0.7789)	(0.7935)	(0.8723)	(0.7193)	(0.9480)	(0.7179)
With Tips						
Men	-3.8026	-2.5482	-4.7312	-3.9658	-4.7241	-3.5054
	(1.1310)	(1.2582)	(1.2187)	(1.0462)	(1.2679)	(1.0063)
Women	-7.7191	-6.0250	-8.6482	-5.7390	-9.0930	-5.1699
	(0.7520)	(0.7557)	(0.8123)	(0.6631)	(0.8607)	(0.6482)

Sources: French Labor Force Survey, 1981-89, matched year to year and American Current Population Survey, 1981-87, matched year to year.

Notes: Coefficients come from logistic regressions conditional on employment at the date t for France and the date t+1 for the United States. For France, the categories are defined as: Narrow = SMIC to 1.10*SMIC, Medium = SMIC to 1.15*SMIC and Wide = SMIC to 1.20*SMIC. For the United States, the categories are defined as: Narrow = $3.35 to $3.75, Medium = $3.35 to $4.00 and Wide = $3.35 to $4.25. See the notes to tables 3, 4 and 6, 7 and 8 for details on other variables in the regressions.

5.b. United States

Table 4 shows the results of estimating equation (2) using the hourly wage measure that excludes income from tips[18]. For both men and women, individuals aged 26 to 35 who are employed in year *t+1* were more likely to have been unemployed or out of the labor force in *t* if their real wage in *t+1* was between the real minimum wage in years *t* and *t+1*. The magnitudes of these effects are large—male elasticities relative to the "marginally above" group of -1.6 and -2.3 for men aged 26-30 and 31-35 and female elasticities of -3.2 and -0.7 for women in the same age groups. On the other hand, the results for workers aged between 36 and 40 go in the opposite direction: workers between the minima have a higher chance of coming from employment than those paid marginally above, the elasticity being 3.7. It should be noted, however, that this result is based on relatively small numbers of observations (see table 1). By weighting the age groups, we find that a decrease in the real minimum wage of 1% between *t* and *t+1* is related to an increased probability of having been non-employed at *t* of 0.42% for those men who are paid between the *t+1* and *t* minimum wages (relative to those employed marginally above the minimum at date *t*)[19].

[18] Estimates based on the wage measure that includes income from tips can be found in appendix B.

[19] For American men under 30, the equivalent number is 2.2% (Abowd *et al.*, 1998).

Table 4
Estimated Effect of Real U.S. Minimum Wage Increases On Prior Employment Probabilities (Excluding Tips) - Detailed Age Categories

Name of effect	Coefficient	Standard Error	P-Value	Elasticity
A. Men, hourly wage				
$21 \leq Age_t \leq 25$	-3.4725	1.4425	0.0160	-0.5664
$26 \leq Age_t \leq 30$	-4.9361	1.6546	0.0030	-0.5465
$31 \leq Age_t \leq 35$	-8.9720	1.7343	0.0000	-0.8611
$36 \leq Age_t \leq 40$	-13.9186	1.7898	0.0000	-1.4973
$41 \leq Age_t \leq 45$	-18.6543	1.7875	0.0000	-2.5769
$46 \leq Age_t \leq 50$	-16.0392	1.8084	0.0000	-2.3256
$51 \leq Age_t \leq 55$	-4.9134	1.8768	0.0090	-0.6287
$56 \leq Age_t$	6.8403	2.0049	0.0010	0.8162
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(21 \leq Age_t \leq 25)$	-6.3444	2.1470	0.0030	-1.5748
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(26 \leq Age_t \leq 30)$	-16.3462	3.5017	0.0000	-4.6169
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(31 \leq Age_t \leq 35)$	-16.1664	4.4097	0.0000	-4.0658
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(36 \leq Age_t \leq 40)$	6.2142	6.9981	0.3750	1.1238
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(41 \leq Age_t \leq 45)$	-6.9491	5.3736	0.1960	-2.0059
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(46 \leq Age_t \leq 50)$	-3.1808	5.4970	0.5630	-0.7952
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(51 \leq Age_t \leq 55)$	-4.2713	5.7809	0.4600	-1.0927
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(56 \leq Age_t)$	-2.7722	5.5873	0.6200	-0.6493
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(21 \leq Age_t \leq 25)$	-6.1935	1.7716	0.0000	-1.4393
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(26 \leq Age_t \leq 30)$	-13.3077	2.6182	0.0000	-2.9953
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(31 \leq Age_t \leq 35)$	-8.7785	3.4280	0.0100	-1.7744
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(36 \leq Age_t \leq 40)$	-11.1244	4.2849	0.0090	-2.5834
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(41 \leq Age_t \leq 45)$	-1.3115	4.2534	0.7580	-0.2895
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(46 \leq Age_t \leq 50)$	-5.9015	4.7737	0.2160	-1.5051
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(51 \leq Age_t \leq 55)$	-6.2780	4.4262	0.1560	-1.5120
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(56 \leq Age_t)$	-3.4710	4.3157	0.4210	-0.6849

Source: American Current Population Survey, 1981-87, matched year to year.

Notes: Equations estimated by maximum likelihood logit. All equations include indicators for year, region (3 categories), nonwhite, married and age (10 categories); and years of schooling, labor force experience (through quartic), and log hourly real wage (1982 prices, through cubic). All displayed coefficients are equal to the indicated group times the real decrease (absolute value of the change in logarithms) in the minimum wage between year t and t+1. The coefficients and elasticities show the partial effects on the probability of employment in year t, given employment in year t+1. A separate equation was estimated for each demographic panel. Only people aged 16-60 years old were considered. Sample size is 71,421.

Table 4 (continued)
Estimated Effect of Real U.S. Minimum Wage Increases On Prior Employment Probabilities (Excluding Tips) - Detailed Age Categories

Name of effect	Coefficient	Standard Error	P-Value	Elasticity
A. Women, hourly wage				
$21 \leq Age_t \leq 25$	3.1440	1.3908	0.0240	0.8510
$26 \leq Age_t \leq 30$	6.7309	1.4908	0.0000	1.4978
$31 \leq Age_t \leq 35$	7.4479	1.5086	0.0000	1.5938
$36 \leq Age_t \leq 40$	6.8232	1.5113	0.0000	1.5748
$41 \leq Age_t \leq 45$	12.6804	1.5574	0.0000	2.7660
$46 \leq Age_t \leq 50$	22.8056	1.6439	0.0000	4.4003
$51 \leq Age_t \leq 55$	31.9469	1.7454	0.0000	5.8009
$56 \leq Age_t$	48.7302	1.9564	0.0000	7.4251
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(21 \leq Age_t \leq 25)$	-9.0535	1.5755	0.0000	-3.5394
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(26 \leq Age_t \leq 30)$	-14.2678	1.9440	0.0000	-5.7108
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(31 \leq Age_t \leq 35)$	-9.5838	2.1103	0.0000	-3.4668
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(36 \leq Age_t \leq 40)$	-8.2292	2.2667	0.0000	-3.2700
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(41 \leq Age_t \leq 45)$	-6.5022	2.4582	0.0080	-2.2465
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(46 \leq Age_t \leq 50)$	-6.4962	2.6236	0.0130	-1.9534
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(51 \leq Age_t \leq 55)$	-11.2321	2.6889	0.0000	-3.5751
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(56 \leq Age_t)$	-10.9929	3.1415	0.0000	-2.6475
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(21 \leq Age_t \leq 25)$	-5.9195	1.4115	0.0000	-1.9741
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(26 \leq Age_t \leq 30)$	-7.7029	1.6348	0.0000	-2.4201
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(31 \leq Age_t \leq 35)$	-8.4522	1.6982	0.0000	-2.7275
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(36 \leq Age_t \leq 40)$	-1.8897	1.7787	0.2880	-0.5692
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(41 \leq Age_t \leq 45)$	-0.6418	1.9927	0.7470	-0.1764
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(46 \leq Age_t \leq 50)$	-5.5597	2.1178	0.0090	-1.4622
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(51 \leq Age_t \leq 55)$	-5.6214	2.3062	0.0150	-1.3480
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(56 \leq Age_t)$	-13.5414	2.4756	0.0000	-3.3371

Source: American Current Population Survey, 1981-87, matched year to year.

Notes: Equations estimated by maximum likelihood logit. All equations include indicators for year, region (3 categories), nonwhite, married and age (10 categories); and years of schooling, labor force experience (through quartic), and log hourly real wage (1982 prices, through cubic). All displayed coefficients are equal to the indicated group times the real decrease (absolute value of the change in logarithms) in the minimum wage between year t and t+1. The coefficients and elasticities show the partial effects on the probability of employment in year t, given employment in year t+1. A separate equation was estimated for each demographic panel. Only people aged 16-60 years old were considered. Sample size is 73,094.

The results for women are more consistently coherent with the hypothesis that minimum wages affect "between" workers more than "marginally above" workers than are the results for American men. The coefficients for the different age groups of the female workers paid around the minimum wage (with the exception of women over 55) are always more negative than those estimated for female workers in the same age group paid marginally above the minimum wage. Furthermore, the average effect of the minimum wage on employment is larger for women than

for men; a decrease of the real minimum wage of 1% between *t* and *t+1* is related to an increased probability of having been non-employed at *t* of 1.57% (relative to marginal workers).

As with the French data, these results are consistent with the perfectly competitive markets view of the labor market, in that decreases in the real minimum wage make non-employed workers easier to employ, and these workers enter disproportionately between the two minimum wages. Larger decreases in the real minimum raise the share of those employed at date *t+1* at real wages between the two minima who were not previously employed at date *t* by a larger amount than for other groups.

It is interesting to note the differences, or rather lack of differences, between the results that measure wages with and without tips (see appendix B). None of the qualitative results seems sensitive to the manner in which we define wages; however, some intuition can be gleaned from how the coefficients shift when going from measures without tips to measures with tips. For men, the differences in the elasticities for between and marginal workers shrink. In other words, when men in the below category are reclassified as between, men in the between category are reclassified as marginal, and men in the marginal category are reclassified as above, the differences in elasticities among the "between" and "marginally-above" categories are reduced. Since this correction is intended to compensate for the differences in the relevant minimum wages for tip- and non-tip receiving workers, it suggests that heterogeneity between employed workers across the wage distribution is also playing a role in determining the differences in elasticities. For women, on the other hand, all of the relevant coefficients become more negative when tips are included in the wage measure. This further reinforces the idea that one needs to control for heterogeneity, as it suggests that the lowest paid workers are even less likely to have been previously employed than their higher-paid counterparts.

One possible explanation of our results for the young Americans is related to our approach that considers *previous* employment in the United States. Among young people, many of the transitions from non-employment to employment could be first jobs following the end of schooling[20]. Since we control for schooling in our estimates, comparing coefficients for "between" workers and "marginally above" workers of the same age should control for early career differences not related to the minimum wage, provided that entry into the labor force does not occur disproportionately in a particular wage category conditional on the individual's educational attainment.

5.c. Overall Elasticities

To improve comparability between our analysis, which is done conditional on the employment state in either year *t* (France) or year *t+1* (U.S.), and other analyses, which consider the effects of the minimum wage unconditional on the previous or future employment state, we compute the unconditional elasticities implied by our estimates. To calculate an unconditional elasticity we apply Bayes law to obtain the relation between the forms of the analysis equations we used for France and the United States. Hence, we have

$$\Pr[e_{t+1}=1|e_t=1,rmiw_t,rmiw_{t+1}]=\Pr[e_t=1|e_{t+1}=1,rmiw_t,rmiw_{t+1}]\frac{\Pr[e_{t+1}=1|rmiw_t,rmiw_{t+1}]}{\Pr[e_t=1|rmiw_t]} \quad (3)$$

[20] See Topel and Ward (1992), among others, for an analysis of early-career mobility in the United States.

To calculate the elasticity we use the following derivative formula:

$$\frac{\partial \ln \Pr[e_{t+1}=1]}{\partial \ln rmiw_{t+1}} = \frac{\partial \ln \Pr[e_{t+1}=1|e_t=1, rmiw_t, rmiw_{t+1}]}{\partial \ln rmiw_{t+1}} - \frac{\partial \ln \Pr[e_t=1|e_{t+1}=1, rmiw_t, rmiw_{t+1}]}{\partial \ln rmiw_{t+1}} \quad (4)$$

Notice that the derivative in equation (4) simplifies because the denominator in the ratio of unconditional probabilities in equation (3) does not depend upon the future minimum wage.

On the right hand side of equation (4) there are two terms. For France, we can estimate only the first of these two terms because the real minimum wage is always increasing. The conditions necessary for estimating the second term occur in the United States, where the real minimum wage is always decreasing. To estimate the unconditional elasticity in equation (4) we must make an assumption regarding the term that cannot be estimated in the particular country. We assume that this term is zero, which means that increases in the real minimum wage do not change the rate at which nonemployed workers become employed and, conversely, decreases in the real minimum wage do not change the rate at which employed workers at *t* remain employed at *t+1*.

To take advantage of the structure of our estimates in Tables 2 and 4, we computed the required conditional elasticities in equation (4) according to the following formula for France, which assumes that the appropriate control group is the individuals who are marginally above the real minimum wage:

$$\frac{\partial \ln \Pr[e_{t+1}=1|e_t=1]}{\partial \ln rmiw_{t+1}} = \Pr[\text{at minimum}] \sum_{\ell} \left[\frac{\partial \ln \Pr[e_{t+1}=1|e_t=1, \ell, \text{at minimum}]}{\partial \ln rmiw_{t+1}} - \frac{\partial \ln \Pr[e_{t+1}=1|e_t=1, \ell, \text{ marginally above}]}{\partial \ln rmiw_{t+1}} \right] \Pr[\ell]$$

where the summation is taken over the different age groups. We use the comparable formula for the US. Our results are summarized in Table 5.

Table 5
Elasticity Estimates for Men and Women
Rate of Change of Employment Probability
for a 1% Increase in the Real Minimum Wage

	France	U.S.
Conditional (aggregated over age groups)		
Men	-1.293	-0.416
Women	-0.972	-1.566
Unconditional (aggregated over age groups)		
Men	-0.015	-0.027
Women	-0.022	-0.179

Sources: France, Tables 1, and 2 and the Labor Force Survey; U.S., Tables 1 and 4, and the Current Population Survey.

Notes: The conditional elasticity is the weighted average of the elasticities for each age group in Tables 2 and 4 reported as the difference between the elasticity for the "at minimum" group as compared to the "marginally above" group. The unconditional elasticity is an estimate of the rate of change of the employment probability in period $t+1$ given a one percent increase in the real minimum wage between periods t and $t+1$.

As an alternative exercise, we could use the estimates from France to capture the first right-hand side term in equation 4 and the estimates from the United States to capture the second. Of course, there are many underlying assumptions that would need to be satisfied for such an approach to be valid. Nevertheless, in this case, we find an unconditional elasticity of employment with respect to the minimum wage of -0.042 for men and -0.201 for women. In both cases, it is the component of the elasticity that is derived from the United States results that dominates (mostly because a larger share of the population is in the “between” category in the United States than in France), but these results suggest that, even in the unconditional sense, a 10 percent increase in the minimum wage reduces male employment by 0.4 percent and female employment by 2 percent.

6. Conclusion

We have shown that, mostly for persons 35 years old and under, in both France and the United States, movements in the real minimum wage are associated with significant employment effects, typically in the direction predicted by competitive labor market theory. In France, as the real SMIC increased over the period from 1981 to 1989, a certain share of young French workers had real wages that fell between the increasing consecutive real minimum wages. For workers in this situation, subsequent employment probabilities fell significantly. However, participation in employment promotion programs apparently shielded the youngest of these workers from some of the effects of the increasing real SMIC, and when this eligibility ended, the probability of

subsequent nonemployment shot up dramatically. In the United States, a comparable effect from the real minimum wage moving in the opposite direction occurred, as many workers had market opportunity wage rates that were passed by the declining real minimum wage over the period from 1981 to 1987. American workers whose current real wage rate would have been below the real minimum wage in earlier periods were much less likely to have been employed in those earlier periods.

By comparing effects of minimum wage movements on workers employed at the minimum with those employed marginally above it, we identify the direct effects of the minimum wage, as distinct from heterogeneity across the wage distribution in labor force attachment and response to macroeconomic shocks. We suppose that workers in these two groups have identical labor supply behavior. We find that those employed between two real minima have much lower subsequent employment probabilities in France and much lower prior employment probabilities in the U.S. Across the population as whole, however, our results also suggest that youth in both countries and women in the U.S. are most affected by movements in the real minimum wage.

Even if the conditional elasticities in question are large, the at-risk groups (workers between two minimum wages) are relatively small, specifically, 1% of adult men and 2% of adult women in France, 6.5% of adult men and 11.6% of adult women in the U.S. Thus, overall unconditional elasticities tend to be much lower than the elasticities conditional on being between the two minima. If the relevant policy question concerns the impact of the minimum wage on those individuals most likely to be affected by it (i.e. those currently paid at the minimum wage), our results suggest that there are much larger negative employment effects on this group, especially as compared to the group in the wage distribution marginally above the minimum, than other research has found.

Our results, which are based on direct data evidence from households, contrast sharply with the results of Card and Krueger (1994, 1998), which are based on direct data evidence from establishments. Recently, Kramarz and Philippon (1998) have analyzed the French data for 1990 to 1997, focusing carefully on the effects of targeted payroll tax subsidies on the total labor cost of minimum wage and low-wage workers. Their results, for a period of analysis that contains intervals in which the total labor cost of minimum wage workers rises and falls, are essentially the same as the ones we find here. *A priori*, there is no reason to prefer household analyses over those based on establishments; however, the strong similarity between the French and American results in our paper present a stronger challenge to the Card and Krueger results than would be the case for an analysis of either country taken by itself.

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Appendix Table A
Statistical History of the "Salaire Minimum Interprofessionnel de Croissance" (SMIC)

Year	Statutory hours per month	Gross Hourly SMIC (Francs)	Gross Real Hourly SMIC (Francs 1970)	Gross Monthly SMIC (Francs)	Net Monthly SMIC (Francs)	Monthly total compensation cost (Francs)	Employee payroll tax rate (% at SMIC)	Employer payroll tax rate (% at SMIC)	Consumer Price Index (1970=100)
1951	173.3	0.89	1.95	154.41	145.15	195.78	6.00	26.79	45.60
1952	173.3	1.00	1.96	173.33	162.93	220.74	6.00	27.35	50.98
1953	173.3	1.00	1.98	173.33	182.33	222.47	6.00	28.35	50.39
1954	173.3	1.15	2.29	199.98	187.98	256.67	6.00	28.35	50.21
1955	173.3	1.25	2.46	216.45	203.46	277.81	6.00	28.35	50.80
1956	173.3	1.26	2.43	218.40	205.30	280.32	6.00	28.35	51.80
1957	173.3	1.29	2.42	223.78	210.35	287.22	6.00	28.35	53.21
1958	173.3	1.46	2.39	253.87	238.64	319.50	6.00	28.85	61.19
1959	173.3	1.58	2.43	270.62	253.84	349.51	6.20	29.15	64.98
1960	173.3	1.61	2.39	279.19	261.88	360.57	6.20	29.15	67.40
1961	173.3	1.64	2.36	284.69	267.04	370.52	6.20	30.15	69.59
1962	173.3	1.72	2.36	298.77	278.45	393.33	7.05	31.65	72.91
1963	173.3	1.84	2.41	319.62	297.09	418.88	7.05	31.05	76.38
1964	173.3	1.89	2.39	328.27	305.13	430.20	7.05	31.05	78.98
1965	173.3	1.97	2.43	342.28	318.15	448.56	7.05	31.05	80.98
1966	173.3	2.06	2.48	358.27	331.15	468.00	7.05	31.36	83.22
1967	173.3	2.13	2.49	368.32	339.66	498.45	8.15	35.33	85.41
1968	173.3	2.68	3.00	484.81	426.84	617.17	8.17	32.78	89.28
1969	173.3	3.16	3.32	548.16	503.32	728.07	8.18	32.82	95.12
1970	173.3	3.42	3.42	591.92	543.50	786.13	8.18	32.81	100.00
1971	173.3	3.76	3.56	651.72	598.15	867.31	8.22	33.08	105.52
1972	173.3	4.19	3.74	725.96	668.00	971.62	8.26	33.84	111.99
1973	173.3	4.95	4.12	858.27	786.52	1151.28	8.36	34.14	120.20
1974	173.3	6.10	4.46	1053.74	967.78	1421.63	8.42	34.53	136.71
1975	173.3	7.26	4.75	1260.25	1150.86	1711.87	8.68	35.82	152.80
1976	173.3	8.34	4.98	1466.01	1306.18	1981.47	9.67	37.03	167.49
1977	173.3	9.40	5.13	1629.59	1464.19	2239.06	10.15	37.40	183.22
1978	173.3	10.61	5.31	1839.61	1650.68	2536.45	10.27	37.88	199.82
1979	173.3	11.94	5.40	2068.69	1817.14	2843.62	12.14	38.91	221.30
1980	173.3	13.80	5.49	2391.67	2085.54	3324.42	12.80	39.00	251.30
1981	173.3	16.30	5.72	2824.41	2478.98	3925.93	12.23	39.00	285.00
1982	169.0	19.17	6.02	3323.46	2892.07	4623.60	12.98	39.12	318.70
1983	169.0	21.50	6.16	3725.87	3216.92	5221.43	13.66	40.14	349.29
1984	169.0	23.53	6.27	4077.88	3465.79	5693.33	15.01	39.62	375.19
1985	169.0	25.44	6.41	4335.00	3676.51	6056.88	15.19	39.72	397.04
1986	169.0	26.53	6.51	4482.87	3777.27	6270.64	15.74	39.88	407.62
1987	169.0	27.60	6.56	4663.84	3894.77	6528.91	16.49	39.99	420.43
1988	169.0	28.65	6.64	4791.71	3977.60	6715.10	16.99	40.14	431.74
1989	169.0	29.54	6.60	4991.42	4093.46	6943.58	17.99	39.11	447.33
1990	169.0	30.80	6.66	5205.20	4269.83	7182.13	17.97	37.89	462.38
1991	169.0	32.30	6.77	5458.70	4547.95	7527.66	17.39	37.90	477.20
1992	169.0	33.58	6.87	5674.46	4606.38	7860.94	17.98	38.53	488.60
1993	169.0	34.45	6.91	5821.21	4794.70	7945.37	18.38	36.49	498.86
1994	169.0	35.20	6.92	5947.96	4881.38	7981.57	18.64	34.19	508.84

Source: Series longues sur les salaires (INSEE, 1998).
Note: Data for 1950-1969 are for the earlier minimum wage system (SMIG).

Appendix Table B
Estimated Effect of Real U.S. Minimum Wage Increases On Prior Employment Probabilities (Including Tips) - Detailed Age Categories

Name of effect	Coefficient	Standard Error	P-Value	Elasticity
A. Men, hourly wage				
$21 \le Age_t \le 25$	-3.7133	1.3866	0.0070	-0.6013
$26 \le Age_t \le 30$	-5.2490	1.6110	0.0010	-0.5811
$31 \le Age_t \le 35$	-9.1430	1.6925	0.0000	-0.8786
$36 \le Age_t \le 40$	-14.0308	1.7511	0.0000	-1.5081
$41 \le Age_t \le 45$	-18.8339	1.7492	0.0000	-2.5996
$46 \le Age_t \le 50$	-16.3178	1.7679	0.0000	-2.3618
$51 \le Age_t \le 55$	-5.0601	1.8390	0.0060	-0.6415
$56 \le Age_t$	6.7701	1.9670	0.0010	0.8107
$(Real\ Min_{t+1} \le Real\ Wage_t \le Real\ Min_t)*(21 \le Age_t \le 25)$	-4.6953	2.2642	0.0380	-1.1402
$(Real\ Min_{t+1} \le Real\ Wage_t \le Real\ Min_t)*(26 \le Age_t \le 30)$	-15.9607	3.7541	0.0000	-4.7073
$(Real\ Min_{t+1} \le Real\ Wage_t \le Real\ Min_t)*(31 \le Age_t \le 35)$	-13.3353	4.9322	0.0070	-3.0539
$(Real\ Min_{t+1} \le Real\ Wage_t \le Real\ Min_t)*(36 \le Age_t \le 40)$	4.4454	7.7487	0.5660	0.8298
$(Real\ Min_{t+1} \le Real\ Wage_t \le Real\ Min_t)*(41 \le Age_t \le 45)$	-2.9877	5.8566	0.6100	-0.7469
$(Real\ Min_{t+1} \le Real\ Wage_t \le Real\ Min_t)*(46 \le Age_t \le 50)$	-4.6705	5.9445	0.4320	-1.2415
$(Real\ Min_{t+1} \le Real\ Wage_t \le Real\ Min_t)*(51 \le Age_t \le 55)$	-5.9574	6.0917	0.3280	-1.6101
$(Real\ Min_{t+1} \le Real\ Wage_t \le Real\ Min_t)*(56 \le Age_t)$	-6.5607	5.7874	0.2570	-1.7636
$(Real\ Min_t \le Real\ Wage_t \le Real\ (\$4.00)_t)*(21 \le Age_t \le 25)$	-6.8262	1.7662	0.0000	-1.6020
$(Real\ Min_t \le Real\ Wage_t \le Real\ (\$4.00)_t)*(26 \le Age_t \le 30)$	-12.6935	2.6654	0.0000	-2.8544
$(Real\ Min_t \le Real\ Wage_t \le Real\ (\$4.00)_t)*(31 \le Age_t \le 35)$	-11.5435	3.4576	0.0010	-2.5990
$(Real\ Min_t \le Real\ Wage_t \le Real\ (\$4.00)_t)*(36 \le Age_t \le 40)$	-10.8373	4.3708	0.0130	-2.6272
$(Real\ Min_t \le Real\ Wage_t \le Real\ (\$4.00)_t)*(41 \le Age_t \le 45)$	-3.7462	4.2574	0.3790	-0.9365
$(Real\ Min_t \le Real\ Wage_t \le Real\ (\$4.00)_t)*(46 \le Age_t \le 50)$	-0.3138	5.1503	0.9510	-0.0740
$(Real\ Min_t \le Real\ Wage_t \le Real\ (\$4.00)_t)*(51 \le Age_t \le 55)$	-5.1100	4.5995	0.2670	-1.2264
$(Real\ Min_t \le Real\ Wage_t \le Real\ (\$4.00)_t)*(56 \le Age_t)$	-1.8436	4.5136	0.6830	-0.3408

Source: American Current Population Survey, 1981-87, matched year to year.

Notes: Equations estimated by maximum likelihood logit. All equations include indicators for year, region (3 categories), nonwhite, married and age (10 categories); and years of schooling, labor force experience (through quartic), and log hourly real wage (1982 prices, through cubic). All displayed coefficients are equal to the indicated group times the real decrease (absolute value of the change in logarithms) in the minimum wage between year t and t+1. The coefficients and elasticities show the partial effects on the probability of employment in year t, given employment in year t+1. A separate equation was estimated for each demographic panel. Only people aged 16-60 years old were considered. Sample size is 71,421.

Appendix Table B (continued)
Estimated Effect of Real U.S. Minimum Wage Increases On Prior Employment Probabilities (Including Tips) - Detailed Age Categories

Name of effect	Coefficient	Standard Error	P-Value	Elasticity
A. Women, hourly wage				
$21 \leq Age_t \leq 25$	3.8903	1.2833	0.0020	1.0529
$26 \leq Age_t \leq 30$	7.2803	1.3950	0.0000	1.6129
$31 \leq Age_t \leq 35$	8.0729	1.4171	0.0000	1.7212
$36 \leq Age_t \leq 40$	7.7631	1.4201	0.0000	1.7884
$41 \leq Age_t \leq 45$	13.4222	1.4676	0.0000	2.9242
$46 \leq Age_t \leq 50$	23.0382	1.5487	0.0000	4.4209
$51 \leq Age_t \leq 55$	32.6692	1.6617	0.0000	5.9337
$56 \leq Age_t$	48.6765	1.8666	0.0000	7.3983
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(21 \leq Age_t \leq 25)$	-11.3338	1.6256	0.0000	-4.6831
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(26 \leq Age_t \leq 30)$	-17.1474	2.0566	0.0000	-7.3606
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(31 \leq Age_t \leq 35)$	-11.0905	2.2165	0.0000	-4.1439
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(36 \leq Age_t \leq 40)$	-10.2470	2.4104	0.0000	-4.1930
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(41 \leq Age_t \leq 45)$	-8.3150	2.5738	0.0010	-2.9113
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(46 \leq Age_t \leq 50)$	-8.8520	2.7342	0.0010	-2.8346
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(51 \leq Age_t \leq 55)$	-11.3742	2.8218	0.0000	-3.5739
$(Real\ Min_{t+1} \leq Real\ Wage_t \leq Real\ Min_t)*(56 \leq Age_t)$	-12.0686	3.2941	0.0000	-3.0079
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(21 \leq Age_t \leq 25)$	-6.6043	1.3639	0.0000	-2.2229
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(26 \leq Age_t \leq 30)$	-8.5586	1.6136	0.0000	-2.7317
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(31 \leq Age_t \leq 35)$	-9.3514	1.6828	0.0000	-3.0981
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(36 \leq Age_t \leq 40)$	-3.4856	1.7688	0.0490	-1.0843
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(41 \leq Age_t \leq 45)$	-1.7565	1.9919	0.3780	-0.4964
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(46 \leq Age_t \leq 50)$	-4.8975	2.1261	0.0210	-1.2695
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(51 \leq Age_t \leq 55)$	-7.8053	2.2738	0.0010	-1.9686
$(Real\ Min_t \leq Real\ Wage_t \leq Real\ (\$4.00)_t)*(56 \leq Age_t)$	-12.6289	2.4772	0.0000	-3.0437

Source: American Current Population Survey, 1981-87, matched year to year.

Notes: Equations estimated by maximum likelihood logit. All equations include indicators for year, region (3 categories), nonwhite, married and age (10 categories); and years of schooling, labor force experience (through quartic), and log hourly real wage (1982 prices, through cubic). All displayed coefficients are equal to the indicated group times the real decrease (absolute value of the change in logarithms) in the minimum wage between year t and t+1. The coefficients and elasticities show the partial effects on the probability of employment in year t, given employment in year t+1. A separate equation was estimated for each demographic panel. Only people aged 16-60 years old were considered. Sample size is 73,094.

Appendix Table C
Differences in Elasticities of Future/Previous Employment Probabilities

	France		United States	
Age	Men	Women	Men	Women
$16 \leq Age \leq 20$	-2.1045	-0.1542	-1.1140	-0.7772
	(6.0977)	(1.5825)	(1.5820)	(0.8550)
$21 \leq Age \leq 25$	-1.4170	-2.0437	-0.1355	-1.5653
	(1.7421)	(1.0841)	(1.7713)	(0.7449)
$26 \leq Age \leq 30$	-3.2181	-2.5721	-1.6216	-3.2907
	(1.8743)	(1.3441)	(4.2231)	(1.1902)
$31 \leq Age \leq 35$	-4.3027	-1.0455	-2.2914	-0.7392
	(5.4992)	(1.3455)	(7.5161)	(1.2324)
$36 \leq Age \leq 40$	0.8552	0.2185	3.7072	-2.7008
	(2.4334)	(1.0361)	(10.8824)	(1.5988)
$41 \leq Age \leq 45$	-2.2583	-3.7943	-1.7165	-2.0700
	(4.8550)	(2.7081)	(11.0871)	(2.0545)
$46 \leq Age \leq 50$	1.4235	-0.3589	0.7099	-0.4912
	(2.2792)	(1.8311)	(11.6294)	(2.3493)
$51 \leq Age \leq 55$	0.0739	-0.8479	0.4193	-2.2270
	(6.2361)	(2.1963)	(11.0640)	(2.9941)
$56 \leq Age$	2.4305	2.1663	0.0355	0.6895
	(26.9559)	(7.0067)	(11.9918)	(3.3252)

Source: Tables 1, 2 and 4.

Notes: Table presents the difference between the elasticity for the "between" group as compared to the "marginally over" group. Standard Errors are in parentheses.