

IZA DP No. 203

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John M. Abowd
Francis Kramarz
David N. Margolis
Thomas Philippon

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John M. Abowd

Cornell University, U.S. Census Bureau, CREST, and NBER

Francis Kramarz

CREST-INSEE, CNRS, Paris, CEPR, London and IZA, Bonn

David N. Margolis

CNRS, TEAM-Université de Paris 1 and CREST

Thomas Philippon

MIT, Cambridge

Discussion Paper No. 203
September 2000

IZA

P.O. Box 7240
D-53072 Bonn
Germany

Tel.: +49-228-3894-0
Fax: +49-228-3894-210
Email: iza@iza.org

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ABSTRACT

The Tail of Two Countries: Minimum Wages and Employment in France and the United States*

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 rate on an individual's employment status. We focus on workers employed at wages close enough to the minimum in a reference year as to be illegal in an adjacent comparison year as a result of movements in the real minimum wage. We find that movements in the American real minimum wage are associated with no employment effects, whereas movements in the cost of French minimum wage workers are associated with very strong negative employment effects. Our analysis is based upon identifying the direct effect of the change in the real minimum wage rate on exits from (entry into) employment when the real minimum wage rate increases (respectively, decreases) and identifying the heterogeneity in the behavior of our treatment and control groups using a pseudo-experimental contrast. We relate the difference-in-difference estimator directly to demand and supply elasticities for the two groups.

JEL Classification: J31, J23

Keywords: Minimum wage, international comparisons, labor demand, labor costs

Francis Kramarz
CREST-INSEE
Département de la Recherche
15, bd Gabriel Péri
92245 Malakoff Cedex
France
Tel.: +33-1-4117 6033
Fax: +33-1-4117 6046
Email: kramarz@ensae.fr

*The authors gratefully acknowledge financial support from CIRANO, the National Science Foundation (SBR-93-21053 and SBER-96-18111 to the NBER) and the Fonds pour la Formation de Chercheurs et l'Aide à la Recherche (97-NC-1676 to Margolis). We would like to thank Danny Blanchflower, David Card, Richard Freeman, Jennifer Hunt, Shulamit Kahn, Larry Katz, Alan Krueger, Thomas Lemieux, Thierry Magnac, John Martin, Costas Meghir, David Neumark, Steve Nickell, Thomas Piketty and workshop participants at the Séminaire Roy, Cornell University, CREST, DELTA, Tinbergen Institute and the Université de Paris 1 Panthéon-Sorbonne for comments on previous versions of this paper. The authors would also like to thank John Van Reenen for letting us use the title of this paper, and Lars Vilhuber for valuable research assistance. The American data used in this study were taken from the NBER extracts of the Current Population Surveys. The French data were taken from the "Enquête Emploi" research files constructed by the Institut National de la Statistique et des Etudes Economiques (INSEE). The French data are also available as public-use samples. For further information contact: INSEE, Département de la diffusion, 18 bd Adolphe Pinard, 75675 Paris Cedex 14, France. The opinions expressed in this are the authors' and not those of any government agency. No U.S. Title 13 confidential data were used in this paper.

1. Introduction

In this paper we examine the link between changes in the real minimum wage rate 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 study how individuals are affected by real increases or real decreases in the minimum wage, conditional on the individual's location in the earnings distribution. We focus on low-wage workers and take particular care to distinguish sub-populations that might be affected differently by the minimum wage. We are also careful to distinguish workers in states where the real minimum wage rate increased from those in states where it decreased in the United States, and to explicitly model changes in the subsidies for minimum and low wage employment in France.

Although little attention has been paid to the situation in continental Europe,¹ some European countries provide interesting alternatives to the much-studied U.S. case. France, in particular, provides a stark contrast to the United States. 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) but the nominal minimum wage rate in France rose steadily over the 1980s and 1990s, as did real minimum wages and the cost of employing minimum wage workers (for most, but not all, years). In this paper we exploit the different growth patterns in real minimum wage rates in a symmetric manner to better understand their effects on employment.

As in the U.S. the original studies of the French minimum wage system used aggregate time-series data and found no effect of the minimum wage system on employment². 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 use of time series models in the original empirical analyses for France was, certainly, the tendency of American applied researchers to rely upon aggregate time series analyses³ 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 using household surveys that are quite comparable. Both of our data sources have a longitudinal design that we exploit extensively to analyze both French and American employment changes in relation to changes in their minimum wage rates and payroll taxes. This paper is a substantial extension of the study we conducted for young workers in both of these countries using similar data (Abowd, Kramarz, Lemieux, and Margolis, 1999).

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 each year's wage distribution into 4 regions: under, around, marginally over and over the minimum wage. By the definition of our categories and through interactions with changes in the real minimum wage, our analysis exploits the size of the movements in the real minimum wage directly.⁴ Real minimum wage variation in the United States comes from nationally legislated increases, state-specific legislated

¹ See Dolado *et. al.* (1996) for a summary of minimum wage studies for France, the Netherlands, Spain and the United Kingdom. See also Brown (1999) for a comprehensive review of recent minimum wage research.

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

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

⁴ Our analysis bears some resemblance to that of Linneman (1982) and Currie and Fallick (1996).

increases, and inflation. For France, we use the automatic and legislated increases in the nominal minimum wage rate that occur (at least) each July, as well as inflation and legislated subsidies for minimum wage labor, to provide variation in the equivalent minimum wage. This variation serves to identify groups of workers whose current wage will fall below the future real minimum wage (in year-pairs when the real minimum wage increases between years), or whose current wage fell below the previous minimum wage (in year-pairs when the real minimum wage declines between years).

Our statistical analysis identifies the change in future or previous employment probabilities given an individual's minimum wage status in the present period. This change in employment probability is compared to the change in employment probability for a "control" group of workers whose wage in the reference year is marginally above the real minimum wage in the comparison year in an attempt to purge the estimates of the impact of unobserved worker heterogeneity that differs according to the position in the wage distribution. We further compare this difference to a reference scenario, specifically, the probability of future employment when minimum wages are decreasing or the probability of previous employment when minimum wages were increasing, to provide difference-in-difference estimates that further control for unobserved heterogeneity. Our theoretical model provides a direct structural interpretation of the difference-in-difference estimator.

We show that, when one considers pairs of years when the real minimum wage increased, individuals whose current real wage was between the current real minimum wage and the future real minimum wage have significantly lower future employment probabilities than those whose real wages were not similarly situated in France but not in the United States. These effects are slightly larger for French men than for French women, with the difference-in-difference elasticity of future employment with respect to changes in the equivalent minimum wage being -2 for men and -1.5 for women. For the United States, the equivalent (insignificant) figures are 0.4 for men and 0.1 for women. On the other hand, we find that between pairs of years when the real minimum wage decreased, individuals whose current real wage was between the current real minimum wage and the previous real minimum wage do not have substantially lower prior employment probabilities than those whose real wages were not similarly situated.

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. Section 3 describes the data that we used to analyze the impact of minimum wages. Section 4 provides an economic interpretation of our natural experiment and its associated pseudo-experiment. Section 5 lays out the statistical models used to evaluate the employment effects of minimum wage changes. Section 6 discusses the results. Section 7 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 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 taxes⁵.

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; 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).

During the 1990s, France experimented with subsidies for minimum wage and low wage employment, implemented as reductions in payroll taxes paid by employers on earnings of workers who received between the minimum wage and 1.33 times the minimum wage (depending upon the year). Figure 1 shows the relation between total labor costs and real minimum wage rates for the analysis period. The payroll tax reductions implied variations in the cost of employing minimum wage workers that did not move in the same direction as the real minimum wage rate. We constructed an equivalent real minimum wage rate that reflects the time series variation in the total labor costs as shown in Figure 1. See Kramarz and Philippon (forthcoming) for additional details.

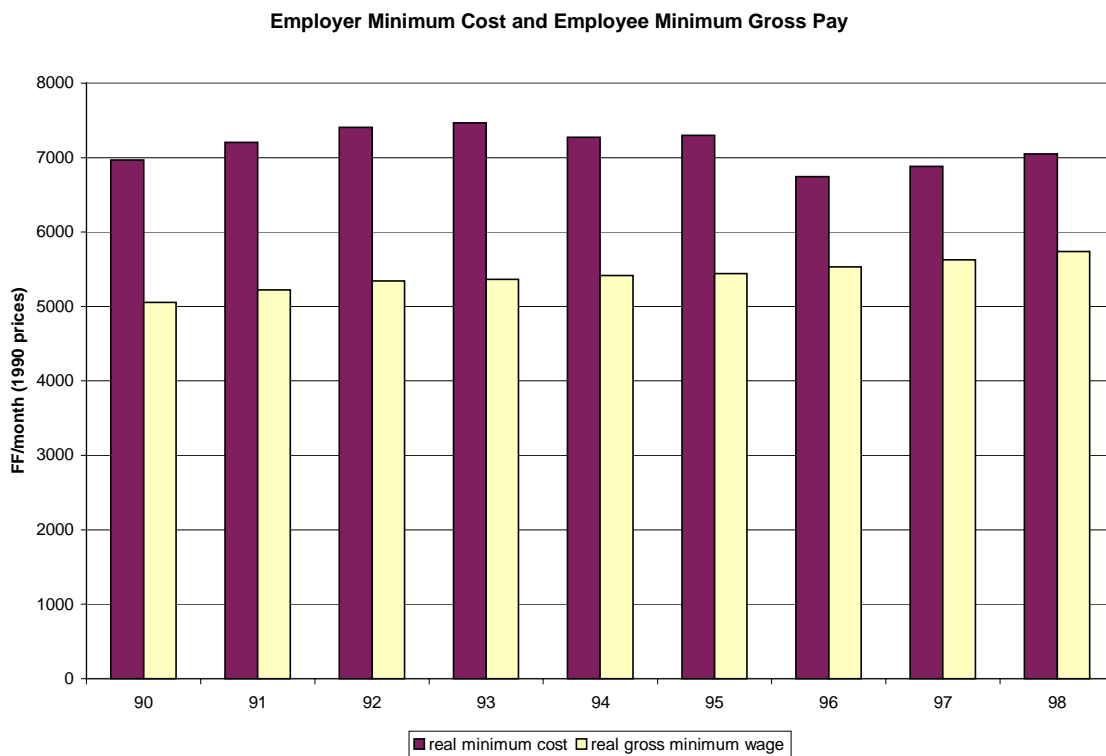


Figure 1

⁵ 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.

The French minimum wage lies near most of the mass of the wage rate distribution for the employed work force. The first mode of the French 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 (Abowd, Kramarz, Lemieux, and Margolis, 1999).

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. Card and Krueger (1995) provide an extensive discussion of the effects of the American minimum wage rate on employment and other outcomes.

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 (Abowd, Kramarz, Lemieux, and Margolis, 1999).

3. Data Description

3.a. France

The French data were extracted from the “Enquête Emploi” (Labor Force Survey) for the years 1990 to 1998. Approximately sixty thousand households included in the Labor Force Survey sample are interviewed in March of three consecutive years with one-third of the households replaced each year. Every member of the household is interviewed and followed provided that he or she does not move during this three-year period. 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 1990-91 to 1997-98.

The survey measures usual monthly earnings, net of employee payroll taxes but including employee income taxes, and usual weekly hours. The minimum wage is defined on an hourly basis, unfortunately the usual weekly hours measure appears to be somewhat noisy. Many respondents report that they work more than 39 hours per week, the legal limit. If one calculates an hourly wage based on these reports, an unreasonable fraction of the employed population is paid below the minimum. For instance, some high-paid young engineers declare more than 50 hours a week. Therefore, we used the monthly wage together with the full-time or part-time status to compute the total labor cost. For workers employed part-time, we used the reported weekly hours to compute their full-time equivalent monthly earnings. For full-time workers, we use the reported monthly earnings.

All young workers 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 (such as “SIVP, stage d’initiation à la vie professionnelle”) were excluded from the database. All of these programs provide a legal exemption from the SMIC and from certain payroll taxes. These programs are limited to workers 25 years old and under. In addition, all workers who declared a wage below 95% of the minimum wage without reporting employment on a special scheme were eliminated from the analysis file (they represent less than 5% of the original file). Most correspond to reporting or coding errors as well as workers on special contracts who did not specify the type of contract. We also eliminated workers employed as civil servants or in the public sector since they cannot become non-employed, owing to their status.

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.

Our control variables consist of education, age, sex, seniority, type of contract, wage, and year. Education was constructed as six categories: none; completed elementary school, junior high school, or basic vocational/technical school; completed advanced vocational/technical school; completed high school (baccalauréat); completed technical college; completed undergraduate or graduate university. Seniority was measured as the response to a direct question in the survey (years with the present employer). The type of contract was constructed as 3 categories: short-term contracts (CDD), temporary work, and long-term contracts (CDI) as in Abowd, Corbel, and Kramarz (1999).

The data on minimum wage rates, price indices and taxes were taken from “Les Retrospectives”, BMS (Bulletin Mensuel de Statistiques, INSEE) in March of each year. The data on tax subsidies were taken from “Liaisons Sociales” (DARES) and “Séries longues sur les Salaires” (INSEE Résultats, édition 1998). We use the information on taxes and the legislated minimum wage to construct an “equivalent minimum wage”, which we call the minimum wage below for simplicity. The equivalent minimum wage is calculated as the minimum wage rate that would provide the same cost to the employer using 1990 tax rates as the current legislated minimum wage does with the current tax rates.

Algebraically, the equivalent minimum wage is defined as $\widetilde{miw}_t = \tau_t / \tau_{1990} miw_t$, where τ_t is the employer payroll tax rate on a worker paid the minimum wage in year t , miw_t is the legislated minimum wage in year t , and \widetilde{miw}_t is the equivalent minimum wage in year t .⁶

⁶ The equivalent minimum wage is the minimum wage that would provide the same compensation cost for a minimum wage worker after normalizing the payroll and subsidy structure to that of a base year. In years when the tax structure changes (relative to the base year) so as to increase the cost of employing a minimum wage worker *ceteris paribus*, the equivalent minimum wage will be higher than the legislated minimum wage. Conversely, in years when additional subsidies render minimum wage employment less costly (for the same real minimum), this would imply an equivalent minimum wage below the legislated minimum. Given the enormous statewide diversity in payroll taxes, and in particular the presence of experience rating that makes each firm’s compensation cost different for a worker with the same gross wage (Margolis and Fougère 2000), we do not attempt to control for this source of variation in the United States.

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 1991. We applied the U.S. Census Bureau matching algorithm to create year-to-year linked files for the years 1981-82 to 1990-91.⁷

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 from the U.S. Bureau of Labor Statistics International Labor Statistics.⁸

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. federal minimum wage was increased to \$3.35/hour in 1980, to \$3.80 in 1990 and finally to \$4.25 in 1991. We accounted for state-specific increases in nominal minimum wages (but not youth sub-minimum rates), as well as the federal increases in 1990 and 1991, using data from Neumark and Wascher (1992).⁹

4. An Economic Model of Minimum Wage and Employment Changes

Our analysis consists of two natural experiments and two pseudo-experiments designed to test our specifications. The natural experiments occur when the real minimum wage rate increases or decreases between two successive years of data. When the real minimum wage increases, we define a treatment group as those individuals whose wage rate in year t is between the year t minimum wage and the new, year $t+1$ minimum wage. We define a control group as those individuals whose year t wage rate is between the year $t+1$ minimum wage and a multiple of the year $t+1$ minimum wage rate. Both treatments and controls are employed in year t . Then, we use our exit model to predict which of these individuals will remain employed in year $t+1$. The structure of this natural experiment is illustrated in Figure 2 in the panel labeled “Natural Experiment” and “Exit Model.” One could interpret the

⁷ David Card graciously provided the computer code for implementing the U.S. Census Bureau CPS matching algorithms.

⁸ We used the web site: <ftp://ftp.bls.gov/pub/special.requests/ForeignLabor/flscpian.txt>

⁹ David Neumark graciously provided us with updated versions of the tables that appear in the paper and continue the accounting through 1992.

difference between the treatments and controls in this natural experiment as the effect of the increased real minimum wage rate.

To test this specification, we consider the following pseudo-experiment. For years in which the real minimum wage rate is decreasing, define the treatment group in the pseudo-experiment as those individuals whose year t wage rates lie in the interval between the year t minimum wage rate and a multiple of that wage rate that equals the average increase in minimum wage rates when they increase. Define the control group in this pseudo-experiment as those individuals whose year t wage rate lies between the upper bound of the pseudo-experiment treatment group and a multiple of this wage rate. Then, we use our exit model to predict which of these individuals will remain employed in year $t+1$. The structure of this pseudo-experiment is illustrated in Figure 2 in the panel labeled “Pseudo-experiment” and “Exit Model.” One could interpret the difference between the treatments and controls in this pseudo-experiment as heterogeneity in the employment responsiveness of individuals in these two regions of the wage distribution. Thus, a difference-in-difference estimator of the effect of the increased real minimum wage rate on subsequent employment probabilities can be constructed by subtracting the estimated (treatment-control) effect in the pseudo-experiment from the estimated (treatment-control) effect in the natural experiment.

Our second natural experiment is constructed symmetrically. When the real minimum wage rate decreases, we define a treatment group as those individuals whose wage rate in year $t+1$ is between the year $t+1$ real minimum wage and the year t real minimum wage rate. We define a control group as those individuals whose year $t+1$ wage rate is between the year t real minimum wage and a multiple of the year t real minimum wage rate. Both treatments and controls are employed in year $t+1$. Then, we use our entry model to predict which of these individuals were employed in year t . The structure of this natural experiment is illustrated in Figure 2 in the panel labeled “Natural Experiment” and “Entry Model.” One could interpret the difference between the treatments and controls in this natural experiment as the effect of the decreased real minimum wage rate.

To test this specification, we consider a second pseudo-experiment. For years in which the real minimum wage rate is increasing, define the treatment group in the pseudo-experiment as those individuals whose year $t+1$ wage rates lie in the interval between the year $t+1$ real minimum wage rate and a multiple of that wage rate that equals the average decrease in minimum wage rates when they decrease. Define the control group in this pseudo-experiment as those individuals whose year $t+1$ real wage rate lies between the upper bound of the pseudo-experimental treatment group and a multiple of this wage rate. Then, we use our entry model to predict which of these individuals was employed in year t . The structure of this pseudo-experiment is illustrated in Figure 2 in the panel labeled “Pseudo-experiment” and “Entry Model.” One could interpret the difference between the treatments and controls in this pseudo-experiment as heterogeneity in the non-employment responsiveness of individuals in these two regions of the wage distribution. Thus, a difference-in-difference estimator of the effect of the decreased real minimum wage rate on prior employment probabilities can be constructed by subtracting the estimated (treatment-control) effect in the second pseudo-experiment from the estimated (treatment-control) effect in the second natural experiment.

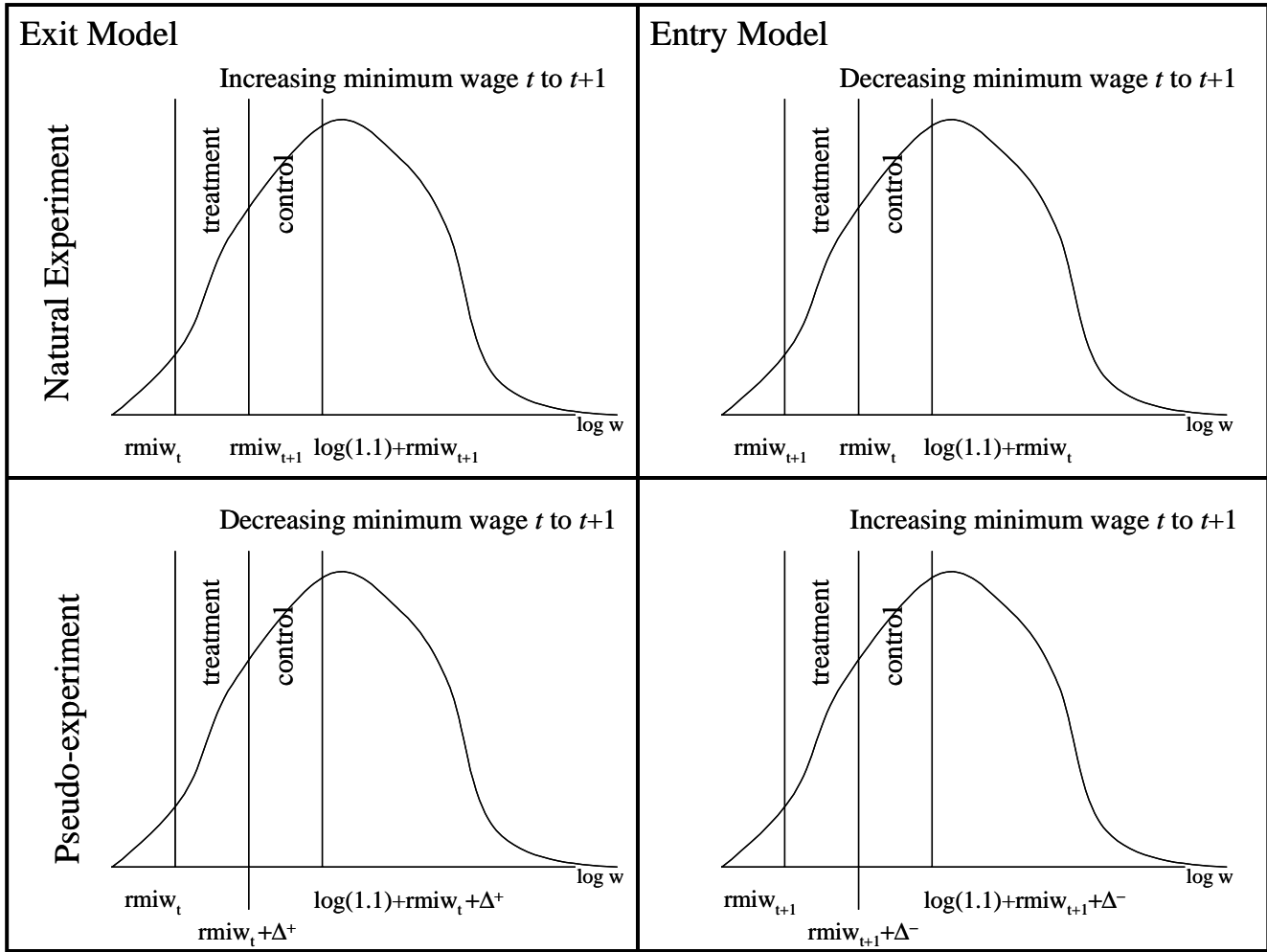


Figure 2

In order to interpret the outcome of our quasi-experimental framework, we consider the effects of minimum wage changes on demand and supply conditions affecting the treatment and control groups. Suppose that the treatments and controls are two distinct types of labor. Then, the demand for each labor type depends upon its own wage rate, the other group's wage rate, and other factors, which we ignore below. The supply of each type of labor depends upon its own wage rate and other factors, which we also ignore.

There are two demand equations:

$$\log L_T = \eta_{TT} \log w_T + \eta_{TC} \log w_C$$

$$\log L_C = \eta_{CT} \log w_T + \eta_{CC} \log w_C$$

where the coefficients on the log wage rates represent Hicks-Allen demand elasticities. Similarly, there are two supply equations:

$$\log L_T = \varepsilon_T \log w_T$$

$$\log L_c = \varepsilon_c \log w_c$$

where the coefficient on the log wage rate in each supply equation is the Allen elasticity of supply. Consider a change in the real minimum wage rate. In the natural experiment, this change increases w_T but there is only movement along the demand curve for the treatment group (the minimum wage rate is binding). There is both a demand and supply response in the market for controls. Hence, the equilibrium quantity changes are:

$$\frac{d \log L_T}{d \log w_T} = \left(\eta_{TT} + \eta_{TC} \left(\frac{\eta_{CT}}{\varepsilon_C - \eta_{CC}} \right) \right) + u_T$$

and

$$\frac{d \log L_C}{d \log w_T} = \varepsilon_C \left(\frac{\eta_{CT}}{\varepsilon_C - \eta_{CC}} \right) + u_C$$

where u_T and u_C represent unmeasured heterogeneity in the response of the treatment and control groups to the change in the minimum wage rate. The treatment-control contrast is:

$$\left[\frac{d \log L_T}{d \log w_T} - \frac{d \log L_C}{d \log w_T} \right]_N = \left(\eta_{TT} + (\eta_{TC} - \varepsilon_C) \left(\frac{\eta_{CT}}{\varepsilon_C - \eta_{CC}} \right) \right) + u_T - u_C.$$

For the simple pseudo-experiment where the change in the minimum wage does not affect the relevant portion of the wage distribution, we have a treatment-control contrast of

$$\left[\frac{d \log L_T}{d \log w_T} - \frac{d \log L_C}{d \log w_T} \right]_P = u_T - u_C.$$

The difference-in-difference contrast, therefore, identifies

$$\left[\frac{d \log L_T}{d \log w_T} - \frac{d \log L_C}{d \log w_T} \right]_N - \left[\frac{d \log L_T}{d \log w_T} - \frac{d \log L_C}{d \log w_T} \right]_P = \left(\eta_{TT} + (\eta_{TC} - \varepsilon_C) \left(\frac{\eta_{CT}}{\varepsilon_C - \eta_{CC}} \right) \right). \quad (1)$$

As long as the minimum wage is binding, equation (1) holds for a decrease in the minimum wage rate for both the natural experiment and the pseudo-experiment.

Our actual data analysis is slightly more complex. When the minimum wage rate increases between years t and $t+1$, we use those periods to generate the natural experiment and we use the other periods, say s and $s+1$, to generate the pseudo-experiment. Similarly, when the minimum wage rate decreases between s and $s+1$ we use those periods to generate the natural experiment and the periods t and $t+1$ to generate the pseudo-experiment. This means that each pair enters the contrasting equations twice, once as a natural experiment (when the minimum wage rate moves in a direction that should affect employment for entry or exit, as appropriate) and once as a pseudo-experiment (when the minimum wage rate moves in a direction that should not affect employment for entry or exit, as

appropriate). Since equation (1) holds in both directions (with the sign of $d \log w_T$ determining the direction of the effect),

$$\begin{aligned} & [d \log L_T - d \log L_C]_N - [d \log L_T - d \log L_C]_P = \\ & \left(\eta_{TT} + (\eta_{TC} - \varepsilon_C) \left(\frac{\eta_{CT}}{\varepsilon_C - \eta_{CC}} \right) \right) \left(I(d \log w_T > 0) d \log w_T + I(d \log w_T < 0) |d \log w_T| \right) \end{aligned} \quad (2)$$

5. Minimum Wage Effects on Employment: Conditional Logit Analysis

Let $rmiw_t$ be the log of the real minimum wage in year t and rw_{it} be the log of the real wage earned by individual i in year t .¹⁰ Furthermore, let $\Delta_t^{rmiw} = I(rmiw_{t+1} - rmiw_t \geq 0)$ denote that year t is the first year of an increasing real minimum wage year pair (an increasing year pair implies $\Delta_t^{rmiw} = 1$)¹¹; $e_{i,t}$ denote the individual's employment status (employed=1) in year t ; and $X_{i,t}$ denote a vector of covariates that also affect the probability of employment, measured for individual i at date t . After conditioning on employment in the reference year, we consider separate (but symmetric) models for entry and exit.

5.1. Exit

In the case of exit, we are interested in analyzing the probability of future employment, conditional on current employment, as a function of the position in the wage distribution and the size of the change in the minimum wage. The variables that determine the position in the wage distribution are a function of whether or not the real minimum wage increases or decreases between t and $t+1$. For year pairs between which the real minimum wage increases, we define the indicator variables $B_{i,t}$ and $M_{i,t}$ as follows:

- $B_{i,t} = I(rmiw_t \leq rw_{i,t} < rmiw_{t+1})$
- $M_{i,t} = I(rmiw_{t+1} \leq rw_{i,t} < \log(1.1) + rmiw_{t+1}).$

Hence, $B_t = \{i | B_{i,t} = 1\}$ represents the treatment group and $M_t = \{i | M_{i,t} = 1\}$ the control group. We also

define $\Delta^+ = \left(\frac{\sum_{i,t} (rmiw_{t+1} - rmiw_t) \times \Delta_t^{rmiw}}{\sum_{i,t} \Delta_t^{rmiw}} \right)$, which corresponds to the average (over person-years) log increase in the real minimum wage for year pairs in which it increases.

¹⁰ 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 divided usual weekly earnings 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. However, since this measure of wages with tips is constructed by dividing earnings by hours, caution is advised when interpreting results that use it. 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. As a result, all of the results we present here use the declared hourly wage measure (when available), i.e. without tips. Results using the measure with tips are very similar to those presented here, and are available upon request.

¹¹ In the U.S. data the real minimum wage rate varies by state; however, we suppress the subscript i for clarity in our comparisons with France.

Our first model estimates the probability that $e_{i,t+1} = 1$ given that $e_{i,t} = 1$, where t is the first year of an increasing minimum wage pair. The functional form is

$$\Pr[e_{i,t+1} = 1 | e_{i,t} = 1, \Delta_t^{rmiw} = 1] = \Lambda \left(\begin{array}{l} X_{i,t} \beta \\ + b \times B_{i,t} \times (rmiw_{t+1} - rmiw_t) \\ + m \times M_{i,t} \times (rmiw_{t+1} - rmiw_t) \end{array} \right), \quad (3)$$

where Λ is the standard logistic function. Equation (3) is the natural experiment for the exit model associated with increasing minimum wage rate. The results are reported in Tables 1 and 2 (for men and women, respectively).

For year pairs between which the real minimum wage decreases, the definitions of $B_{i,t}$ and $M_{i,t}$ provided above are no longer valid. We redefine the indicator variables $B_{i,t}$ and $M_{i,t}$ as follows:

- $B_{i,t} = I(rmiw_t \leq rw_{i,t} < rmiw_t + \Delta^+)$
- $M_{i,t} = I(rmiw_t + \Delta^+ \leq rw_{i,t} < \log(1.1) + rmiw_t + \Delta^+)$.

Using these definitions, we estimate a similar model in years of decreasing real minimum wage year pairs:

$$\Pr[e_{i,t+1} = 1 | e_{i,t} = 1, \Delta_t^{rmiw} = 0] = \Lambda \left(\begin{array}{l} X_{i,t} \beta \\ + b \times B_{i,t} \times |rmiw_{t+1} - rmiw_t| \\ + m \times M_{i,t} \times |rmiw_{t+1} - rmiw_t| \end{array} \right). \quad (4)$$

Equation (4) corresponds to the pseudo-experiment for the exit model associated with the decreasing minimum wage rate. The results are also reported in Tables 1 and 2 (for men and women, respectively).

Our first difference-in-difference estimator assumes symmetric adjustment to increases and decreases in the real minimum wage, although of opposite sign (see equation S2). By pooling all year pairs for which $e_{i,t} = 1$ and allowing the sign of the wage change to determine the direction of the effect, we arrive at the estimating equation:

$$\Pr[e_{i,t+1} = 1 | e_{i,t} = 1] = \Lambda \left(\begin{array}{l} X_{i,t} \beta \\ + b \times B_{i,t} \times (rmiw_{t+1} - rmiw_t) \\ + m \times M_{i,t} \times (rmiw_{t+1} - rmiw_t) \end{array} \right), \quad (5)$$

The results of equation (5) are reported in Tables 5 and 6 (for men and women, respectively).

A more general version of equation (5) includes indicator variables for the position in the wage distribution:

$$\Pr[e_{i,t+1} = 1 | e_{i,t} = 1] = \Lambda \left(\begin{array}{l} X_{i,t} \beta + b_0 B_{i,t} + m_0 M_{i,t} \\ + b \times B_{i,t} \times (rmiw_{t+1} - rmiw_t) \\ + m \times M_{i,t} \times (rmiw_{t+1} - rmiw_t) \end{array} \right). \quad (6)$$

The results of equation (6) are reported in Tables 9 and 10 (for men and women, respectively). The identification of b_0 separately from b , as well as the identification of m_0 separately from m , relies on sufficient variation in $(rmiw_{t+1} - rmiw_t)$. Given that this term is positive when $\Delta_t^{rmiw} = 1$ and negative otherwise, all of the coefficients in equation (6) should be identified. There is insufficient variation in $(rmiw_{t+1} - rmiw_t)$ to identify $B_{i,t}$ and $M_{i,t}$ in equations (3) and (4).

An extended version of equation (2), with separate coefficients for increases and decreases in the minimum wage, produces two asymmetric exit models:

$$\Pr[e_{i,t+1} = 1 | e_{i,t} = 1] = \Lambda \left(\begin{array}{l} X_{i,t}\beta \\ + b^{inc} \times B_{i,t} \times (rmiw_{t+1} - rmiw_t) \times \Delta_t^{rmiw} \\ + m^{inc} \times M_{i,t} \times (rmiw_{t+1} - rmiw_t) \times \Delta_t^{rmiw} \\ + b^{dec} \times B_{i,t} \times |rmiw_{t+1} - rmiw_t| \times (1 - \Delta_t^{rmiw}) \\ + m^{dec} \times M_{i,t} \times |rmiw_{t+1} - rmiw_t| \times (1 - \Delta_t^{rmiw}) \end{array} \right), \quad (7)$$

and

$$\Pr[e_{i,t+1} = 1 | e_{i,t} = 1] = \Lambda \left(\begin{array}{l} X_{i,t}\beta + b_0 B_{i,t} + m_0 M_{i,t} \\ + b^{inc} \times B_{i,t} \times (rmiw_{t+1} - rmiw_t) \times \Delta_t^{rmiw} \\ + m^{inc} \times M_{i,t} \times (rmiw_{t+1} - rmiw_t) \times \Delta_t^{rmiw} \\ + b^{dec} \times B_{i,t} \times |rmiw_{t+1} - rmiw_t| \times (1 - \Delta_t^{rmiw}) \\ + m^{dec} \times M_{i,t} \times |rmiw_{t+1} - rmiw_t| \times (1 - \Delta_t^{rmiw}) \end{array} \right). \quad (8)$$

Equation (7) generalizes equation (5) and equation (8) generalizes equation (6). The results for equation (7) are reported in Tables 5 and 6 (for men and women, respectively). The results for equation (8) are reported in Tables 9 and 10 (for men and women, respectively).

5.2. Entry

Entry models consider the probability of previous employment, conditional on current employment as a function of the individual's position in the wage distribution and the size of the change in the minimum wage. As before, the variables that determine the position in the wage distribution are a function of whether or not the real minimum wage increases or decreases between t and $t+1$. For year pairs between which the real minimum wage decreases, we define the indicator variables $B_{i,t+1}$ and $M_{i,t+1}$ as follows:

- $B_{i,t+1} = I(rmiw_{t+1} \leq rw_{i,t+1} < rmiw_t)$
- $M_{i,t+1} = I(rmiw_t \leq rw_{i,t+1} < \log(1.1) + rmiw_t)$.

Hence, $B_{t+1} = \{i | B_{i,t+1} = 1\}$ represents the treatment group and $M_{t+1} = \{i | M_{i,t+1} = 1\}$ the control group.

We define $\Delta^- = \left(\frac{\sum_{i,t} (rmiw_t - rmiw_{t+1}) \times (1 - \Delta_t^{rmiw})}{\sum_{i,t} (1 - \Delta_t^{rmiw})} \right)$, which corresponds to the average (over person-years) log

decrease in the real minimum wage for year pairs in which it declines.

Our first entry model estimates the probability that $e_{i,t} = 1$ given $e_{i,t+1} = 1$, where $t+1$ corresponds to the second year of a decreasing minimum wage year pair. The functional form is

$$\Pr[e_{i,t} = 1 | e_{i,t+1} = 1, \Delta_t^{miw} = 0] = \Lambda \left(\begin{array}{l} X_{i,t+1}\beta \\ + b \times B_{i,t+1} \times (rmiw_t - rmiw_{t+1}) \\ + m \times M_{i,t+1} \times (rmiw_t - rmiw_{t+1}) \end{array} \right). \quad (9)$$

Equation (9) corresponds to the entry model natural experiment. The results are reported in Tables 3 and 4 (for men and women, respectively).

In the case of entry, for year pairs between which the real minimum wage increases, the definitions used above of $B_{i,t+1}$ and $M_{i,t+1}$ are again no longer valid. Thus we redefine the indicator variables $B_{i,t+1}$ and $M_{i,t+1}$ as follows:

- $B_{i,t+1} = I(rmiw_{t+1} \leq rw_{i,t+1} < rmiw_{t+1} + \Delta^-)$
- $M_{i,t+1} = I(rmiw_{t+1} + \Delta^- \leq rw_{i,t+1} < \log(1.1) + rmiw_{t+1} + \Delta^-)$.

Using these definitions, we estimate a similar logit model in years of increasing real minimum wage year pairs:

$$\Pr[e_{i,t} = 1 | e_{i,t+1} = 1, \Delta_t^{miw} = 1] = \Lambda \left(\begin{array}{l} X_{i,t+1}\beta \\ + b \times B_{i,t+1} \times |rmiw_t - rmiw_{t+1}| \\ + m \times M_{i,t+1} \times |rmiw_t - rmiw_{t+1}| \end{array} \right). \quad (10)$$

Equation (10) corresponds to the pseudo-experiment for the entry model associated with the increasing minimum wage rate. The results are also reported in Tables 3 and 4 (for men and women, respectively).

Our second difference-in-difference estimator assumes symmetric adjustment to increases and decreases in the real minimum wage, although of opposite sign (see equation S2). By pooling all year pairs for which $e_{i,t+1} = 1$ and allowing the sign of the wage change to determine the direction of the effect, we arrive at the estimating equation:

$$\Pr[e_{i,t} = 1 | e_{i,t+1} = 1] = \Lambda \left(\begin{array}{l} X_{i,t+1}\beta \\ + b \times B_{i,t+1} \times (rmiw_t - rmiw_{t+1}) \\ + m \times M_{i,t+1} \times (rmiw_t - rmiw_{t+1}) \end{array} \right). \quad (11)$$

The results of equation (11) are reported in Tables 7 and 8 (for men and women, respectively).

A more general version of equation (11) includes indicator variables for the position in the wage distribution:

$$\Pr[e_{i,t} = 1 | e_{i,t+1} = 1] = \Lambda \left(\begin{array}{l} X_{i,t+1}\beta + b_0 B_{i,t+1} + m_0 M_{i,t+1} \\ + b \times B_{i,t+1} \times (rmiw_t - rmiw_{t+1}) \\ + m \times M_{i,t+1} \times (rmiw_t - rmiw_{t+1}) \end{array} \right). \quad (12)$$

The results of equation (12) are reported in Tables 11 and 12 (for men and women, respectively).

An extended version of equation (2), with separate coefficients for increases and decreases in the minimum wage, produces two asymmetric exit models:

$$\Pr[e_{i,t} = 1 | e_{i,t+1} = 1] = \Lambda \left(\begin{array}{l} X_{i,t+1} \beta \\ + b^{dec} \times B_{i,t+1} \times (rmiw_t - rmiw_{t+1}) \times (1 - \Delta_t^{rmiw}) \\ + m^{dec} \times M_{i,t+1} \times (rmiw_t - rmiw_{t+1}) \times (1 - \Delta_t^{rmiw}) \\ + b^{inc} \times B_{i,t+1} \times |rmiw_t - rmiw_{t+1}| \times \Delta_t^{rmiw} \\ + m^{inc} \times M_{i,t+1} \times |rmiw_t - rmiw_{t+1}| \times \Delta_t^{rmiw} \end{array} \right). \quad (13)$$

and

$$\Pr[e_{i,t} = 1 | e_{i,t+1} = 1] = \Lambda \left(\begin{array}{l} X_{i,t+1} \beta + b_0 B_{i,t+1} + m_0 M_{i,t+1} \\ + b^{dec} \times B_{i,t+1} \times (rmiw_t - rmiw_{t+1}) \times (1 - \Delta_t^{rmiw}) \\ + m^{dec} \times M_{i,t+1} \times (rmiw_t - rmiw_{t+1}) \times (1 - \Delta_t^{rmiw}) \\ + b^{inc} \times B_{i,t+1} \times |rmiw_t - rmiw_{t+1}| \times \Delta_t^{rmiw} \\ + m^{inc} \times M_{i,t+1} \times |rmiw_t - rmiw_{t+1}| \times \Delta_t^{rmiw} \end{array} \right). \quad (14)$$

Equation (13) generalizes equation (11) and equation (14) generalizes equation (12). The results for equation (13) are reported in Tables 7 and 8 (for men and women, respectively). The results for equation (14) are reported in Tables 11 and 12 (for men and women, respectively).

6. Discussion of the Results

In all our tables we report only the coefficients and elasticities on the key real minimum wage rate variables. The differences in elasticities reported in the tables are contrasts of partial elasticities based on the formulas:

$$\begin{aligned} \text{Difference in exit elasticities} &= \frac{\partial \ln \Pr[e_{t+1} = 1 | e_t = 1, rmiw_t, rmiw_{t+1}, B_t = 1]}{\partial \ln rmiw_{t+1}} \\ &\quad - \frac{\partial \ln \Pr[e_{t+1} = 1 | e_t = 1, rmiw_t, rmiw_{t+1}, M_t = 1]}{\partial \ln rmiw_{t+1}} \end{aligned}$$

$$\begin{aligned} \text{Difference in entry elasticities} &= \frac{\partial \ln \Pr[e_t = 1 | e_{t+1} = 1, rmiw_t, rmiw_{t+1}, B_t = 1]}{\partial \ln rmiw_{t+1}} \\ &\quad - \frac{\partial \ln \Pr[e_t = 1 | e_{t+1} = 1, rmiw_t, rmiw_{t+1}, M_t = 1]}{\partial \ln rmiw_{t+1}} \end{aligned}$$

Both formulas are evaluated at the sample means of the exit and entry rates for the treatment and control groups.

6.a. Exit

Tables 1 and 2 present the basic results of our exit model for men and women, respectively, distinguishing between pairs of years when the real minimum wage increases and pairs of years when it decreases. For increasing real minimum wage year pairs, we are estimating equation (3), while for decreasing real minimum wage year pairs, we estimate equation (4). We report only the coefficients and elasticities on the key real minimum wage variables.

These two tables show a result that is common to all of our analyses—namely, that the French minimum wage laws result in substantial employment loss while the American laws do not. For men (Table 1) the natural experiment estimate of the exit elasticity of subsequent employment with respect to the real minimum wage rate is essentially zero (0.0105 ± 0.4001) whereas the comparable estimate for French men is substantial (-1.9672 ± 0.7598). The exit elasticity in the natural experiment may be

interpreted as an estimate of $\left(\eta_{TT} + (\eta_{TC} - \varepsilon_C) \left(\frac{\eta_{CT}}{\varepsilon_C - \eta_{CC}} \right) \right) + u_T - u_C$. The pseudo-experiment estimate

of the difference in exit elasticities for American men is -0.3631 ± 0.2722 and the comparable estimate for French men is 0.3136 ± 0.3116 . The pseudo-experimental differences in exit elasticities can be interpreted as an estimate of $u_T - u_C$. Finally, we apply the difference-in-difference estimator. For

American men the resulting contrast in exit elasticities is 0.3736 ± 0.4839 , which is essentially zero. For French men the contrast is -2.2809 ± 0.8212 , a very substantial estimate. The difference-in-difference

estimator provides a direct estimate of $\left(\eta_{TT} + (\eta_{TC} - \varepsilon_C) \left(\frac{\eta_{CT}}{\varepsilon_C - \eta_{CC}} \right) \right)$, which is the sum of η_{TT} , the

Hicks-Allen own elasticity of demand for the treatment group (those subject to the increase in the minimum wage rate) and a term whose sign depends upon the difference between the Hicks-Allen elasticity of demand for the treatment group with respect to the wage rate of the control group, η_{TC} , which is positive provided that the treatments and controls are demand substitutes, and the Allen elasticity of supply, ε_C , for the control group. The magnitude of the departure of the estimated exit elasticity from the own elasticity of demand for the treatment group also depends upon the ratio

$\left(\left(\frac{\eta_{CT}}{\varepsilon_C - \eta_{CC}} \right) \right)$, which must be positive. Table 1 shows that η_{TT} dominates the result for France but for

the U.S. the cross-elasticity of demand, η_{TC} , must dominate the elasticity of supply, ε_C in order for the difference between them to be positive. The results for women are shown in Table 2. Going directly to the difference-in-difference estimator, we find that American women are essentially unaffected by changes in the minimum wage rate (0.0821 ± 0.3517). On the other hand, French women are strongly affected by changes in the minimum wage rate (-1.5350 ± 0.5747).

Consider next the specification that pools both increases and decreased in the real minimum wage rate. This specification estimates equation (5), with pooled symmetric effects, and equation (7), with asymmetric effects. The results are presented in Tables 5 and 6 (for men and women, respectively). When applying equation (5), the difference-in-difference estimator is produced directly by using the difference in coefficients or elasticities. For American men the difference in exit elasticities is 0.1730 ± 0.2254 , which is essentially zero. For French men this difference is -0.4041 ± 0.2506 , which is smaller than the estimate presented in Table 1 but still substantially negative. For American women (Table 6) the difference in exit elasticities is 0.2027 ± 0.1719 , again essentially zero, whereas for French women we find -0.2983 ± 0.1997 , again smaller than in Table 2 but still substantially negative. When we allow for asymmetry in the response, we can again calculate the

difference-in-difference estimator of the exit elasticities. For American men we find 0.2647 ± 0.5277 , again near zero, whereas for French men we have -1.6790 ± 0.9569 , substantially negative. For American women the asymmetric estimator gives 0.1501 ± 0.3892 , again essentially zero, and for the French women we have -1.2945 ± 0.7749 , substantially negative. The asymmetric results are very similar to those presented in Tables 1 and 2, which implicitly allowed asymmetry in the response.

Finally, we present in Tables 9 and 10 estimates of the exit elasticities based upon equations (6) and (8). These estimates allow for a direct effect of being in the “Between” or “Marginal” groups on the conditional probability of exiting employment. These results are essentially identical to those presented in Tables 5 and 6 for the United States and for the symmetric French estimates. The asymmetric French results are less precisely estimated. The separate identification of a main effect for the treatment and control groups as well as an interaction effect with the change in the minimum wage rate requires sufficient variation in the change in the minimum wage rate across years (recall that there is also an unrestricted year effect in the model). In the United States, the variation in state minimum wage rates contributes to this identification; however, in France, there must be sufficient year-to-year variability in the changes of the national minimum wage rate. Our results indicate that this year-to-year variability may not be sufficient to well-identify the asymmetric estimator for France.

6.b. Entry

Tables 3 and 4 present the basic results of our entry model for men and women, respectively, distinguishing between pairs of years when the real minimum wage decreases and pairs of years when it increases. For decreasing real minimum wage year pairs, we are estimating equation (9), while for increasing real minimum wage year pairs, we estimate equation (10). We report only the coefficients and elasticities on the key real minimum wage variables.

These two tables show a result that is common to all of our analyses—namely, that neither the French minimum wage tax subsidies nor the American real minimum wage decreases clearly facilitate entry. Since the interpretation of the entry elasticity components is identical to the exit model discussion, we discuss only the difference-in-difference estimator. For American men the contrast in entry elasticities is -0.2705 ± 0.4634 , which is essentially zero. For French men the contrast is 0.2499 ± 0.9775 , again, essentially zero. Since the difference-in-difference estimator provides a direct

estimate of $\left(\eta_{TT} + (\eta_{TC} - \varepsilon_C) \left(\frac{\eta_{CT}}{\varepsilon_C - \eta_{CC}} \right) \right)$, the results show that neither part clearly dominates. The

results for women are shown in Table 4. Going directly to the difference-in-difference estimator, we find that American women are essentially unaffected by changes in the minimum wage rate (-0.2770 ± 0.3951) as are French women (-0.0710 ± 0.5509).

Consider next the specification that pools both increases and decreased in the real minimum wage rate. This specification estimates equation (11), with pooled symmetric effects, and equation (13), with asymmetric effects. The results are presented in Tables 7 and 8 (for men and women, respectively). When applying equation (11), the difference-in-difference estimator is produced directly by using the difference in coefficients or elasticities. The analysis periods for the American data are identical to the periods used in the comparable exit tables. However, for Tables 7, 8, 11, and 12 we consider a different set of years for the French data. When we used the same year pairs as in Tables 3 and 4 for the analysis of the pooled French data, our estimates were essentially identical to those in Tables 3 and 4. We decided to focus the pooled French analysis on the years that followed the large tax subsidies for employers of minimum wage workers that were enacted in the mid-1990s. We remind the reader that the real minimum wage rate cannot fall in France (by law). Our declining equivalent real minimum wage rate results from the effects of these tax subsidies on the cost of employing a minimum

wage worker. These subsidies began in 1993 and, as Figure 2 shows, produced decreases in the cost of employing a minimum wage worker for the pairs 1993-1994 and 1995-1996, of which 1995-1996 was much larger.

Considering the pooled analysis in Table 7, the estimated difference in entry elasticities for American men is -0.3391 ± 0.2368 , which is small but clearly negative. For French men this difference is -0.4596 ± 0.3499 , which is also small but still negative. For American women (Table 8) the difference in entry elasticities is -0.5670 ± 0.2108 , again clearly negative, whereas for French women we find -0.2998 ± 0.2621 , which is essentially zero. When we allow for asymmetry in the response, we can again calculate the difference-in-difference estimator of the entry elasticities. For American men we find -0.1865 ± 0.5137 , essentially zero, whereas for French men we have -0.7004 ± 0.8776 , again zero. For American women the asymmetric estimator gives -0.3129 ± 0.4466 , again essentially zero, and for the French women we have -1.1412 ± 0.7992 , negative but imprecise.

Finally, we present in Tables 11 and 12 estimates of the entry elasticities based upon equations (12) and (14). These estimates allow for a direct effect of being in the “Between” or “Marginal” groups on the conditional probability of entering employment. These results are quite different from those presented in Tables 7 and 8. The entry analysis reveals that there is considerable unmeasured heterogeneity between the treatment and control groups. This is captured by the coefficients on the indicators for “Between” and “Marginal,” which are precisely estimated in both countries, in contrast with the results in the exit analysis.

7. Conclusion

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 changes in the real minimum wage rate on exits from employment and entry into employment. By constructing an appropriate pseudo-experimental contrast, we identify the heterogeneity in the responses of the individuals employed near the minimum wage rate as compared with those who are marginally above them in the wage distribution. Our difference-in-difference estimator, which removes the estimated heterogeneity from the direct effect of the minimum wage rate is directly interpretable as a function of the demand and supply elasticities associated with the treatment and control groups. We find that exits from employment are not very sensitive to changes in the minimum wage rate in the U.S. whereas in France there is a strong negative effect. Entry into employment is not very sensitive to changes in the minimum wage rate in either country. There is not much difference in the responses of men and women in either country even though more women are paid near the minimum wage rate in both countries.

Even when the conditional exit and entry elasticities are large, the treatment groups are small, 3-5% of men and 8% of women in both countries. Thus, unconditional elasticities of employment are much lower than our estimated conditional ones. 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 large negative employment effects on this group in France but not in the United States.

Our results, which are based on direct data evidence from households, are compatible with the results of Card and Krueger (1994, forthcoming), which are based on direct data evidence from American establishments. Kramarz and Philippon (forthcoming) have analyzed the French data for 1990 to 1998, 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 for France.

Our major contribution to the minimum wage debate consists of carefully analyzing both the direct effects of a change in the real minimum wage and the effects of heterogeneity in the behavior of individuals who are near each other in the wage distribution under circumstances of both increasing and decreasing real minimum wage rates. If a single set of behavioral parameters were able to explain gains and losses of employment surrounding changes in the minimum wage rate, this methodology would have detected it. Because we obtain very different results for the two countries when we study the exit model, it is clear that a single set of demand and supply parameters is not consistent with the data. There is no “employment effect of changing the minimum wage rate,” properly defined. Rather, it appears to depend upon the level of the real minimum wage rate inclusive of both employer and employee payroll taxes, which is much higher in France and the direction of the change of the real minimum, which regularly moves up and down in the U.S. but almost always goes up in France.

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Table 1

**Estimated Effect of Real Minimum Wage Changes On Subsequent Employment Probabilities: Men
Separate Models for Increasing and Decreasing Minimum Wage Year Pairs**

	Coefficient	Coefficient Std. Error	P(Emp _{t+1} =1)	Share of Employed at t	Elasticity	Elasticity Std. Error
<i>United States - Increasing Real Minimum Year Pairs</i>						
Between*(rmiw _{t+1} -rmiw _t)	-2.8553	(1.2794)	0.7816	0.0459	-0.6235	(0.2794)
Marginal*(rmiw _{t+1} -rmiw _t)	-3.2083	(1.8146)	0.8024	0.0187	-0.6341	(0.3586)
Difference in Coefficients or Elasticities	0.3530	(1.9621)	Observations= 27024		0.0105	(0.4001)
<i>United States - Decreasing Real Minimum Year Pairs</i>						
Between* rmiw _{t+1} -rmiw _t	-2.8680	(1.0147)	0.7932	0.0760	-0.5932	(0.2099)
Marginal* rmiw _{t+1} -rmiw _t	-1.2652	(1.3631)	0.8181	0.0284	-0.2301	(0.2479)
Difference in Coefficients or Elasticities	-1.6028	(1.4329)	Observations = 95497		-0.3631	(0.2722)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	1.9557	(2.4296)			0.3736	(0.4839)
<i>France - Increasing Real Minimum Year Pairs (t= 1990-1992)</i>						
Between*(rmiw _{t+1} -rmiw _t)	-16.4165	(4.0623)	0.8258	0.0284	-2.8598	(0.7077)
Marginal*(rmiw _{t+1} -rmiw _t)	-7.5191	(3.5176)	0.8813	0.0534	-0.8925	(0.4175)
Difference in Coefficients or Elasticities	-8.8975	(4.4523)	Observations = 25495		-1.9672	(0.7598)
<i>France - Decreasing Real Minimum Year Pairs (t=1995)</i>						
Between* rmiw _{t+1} -rmiw _t	-0.9088	(2.7075)	0.8668	0.0177	-0.1211	(0.3606)
Marginal* rmiw _{t+1} -rmiw _t	-3.5542	(1.7166)	0.8777	0.0546	-0.4347	(0.2099)
Difference in Coefficients or Elasticities	2.6455	(2.9607)	Observations = 13665		0.3136	(0.3116)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	-11.5430	(5.3468)			-2.2809	(0.8212)

Sources: American Current Population Survey, 1981-91, January-May, September-December, matched year to year, and French Labor Force Survey (Enquête Emploi), 1990-1998, matched year to year.

Notes: Equations estimated by logit conditional on employment in year t. U.S. equations include year (10 categories), region (3 categories), nonwhite, married, age (10 categories), years of schooling, labor force experience (through quartic), and log hourly real wage (1982 prices, through cubic). French equations include year (6 categories), contract type (3 categories), log monthly real wage (1990 prices, through cubic), education (6 categories), age (8 categories), seniority (through quadratic). Only individuals age 16-60 years in year t were used. In France, workers on youth employment contracts, civil-servants, and workers employed in public firms were also excluded. The real minimum wage rate in the U.S. varies from state to state. The real minimum wage rate in France is national.

Table 2						
Estimated Effect of Real Minimum Wage Changes On Subsequent Employment Probabilities: Women						
Separate Models for Increasing and Decreasing Minimum Wage Year Pairs						
	Coefficient	Coefficient Std. Error	P(Emp _{t+1} =1)	Share of Employed at t	Elasticity	Elasticity Std. Error
<i>United States - Increasing Real Minimum Year Pairs</i>						
Between*(rmiw _{t+1} -rmiw _t)	-1.9446	(0.8430)	0.7352	0.0797	-0.5149	(0.2232)
Marginal*(rmiw _{t+1} -rmiw _t)	-0.5573	(1.0480)	0.7731	0.0404	-0.1265	(0.2378)
Difference in Coefficients or Elasticities	-1.3874	(1.1629)	Observations = 29774		-0.3884	(0.2810)
<i>United States - Decreasing Real Minimum Year Pairs</i>						
Between* rmiw _{t+1} -rmiw _t	-3.2815	(0.6592)	0.7182	0.1420	-0.9247	(0.1858)
Marginal* rmiw _{t+1} -rmiw _t	-1.8245	(0.7791)	0.7511	0.0693	-0.4541	(0.1939)
Difference in Coefficients or Elasticities	-1.4569	(0.8074)	Observations = 98413		-0.4705	(0.2116)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	0.0696	(1.4157)			0.0821	(0.3517)
<i>France - Increasing Real Minimum Year Pairs (t= 1990-1992)</i>						
Between*(rmiw _{t+1} -rmiw _t)	-13.1078	(3.1603)	0.8388	0.0772	-2.1130	(0.5094)
Marginal*(rmiw _{t+1} -rmiw _t)	-4.9449	(3.0674)	0.8852	0.1043	-0.5677	(0.3521)
Difference in Coefficients or Elasticities	-8.1629	(3.5158)	Observations = 17057		-1.5453	(0.5441)
<i>France - Decreasing Real Minimum Year Pairs (t=1995)</i>						
Between* rmiw _{t+1} -rmiw _t	-0.5905	(1.9647)	0.8606	0.0541	-0.0823	(0.2739)
Marginal* rmiw _{t+1} -rmiw _t	-0.6578	(1.6195)	0.8905	0.1053	-0.0720	(0.1773)
Difference in Coefficients or Elasticities	0.0673	(2.5461)	Observations = 9648		-0.0103	(0.1851)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	-8.2302	(4.3409)			-1.5350	(0.5747)
Sources and notes: see Table 1.						

Table 3

**Estimated Effect of Real Minimum Wage Changes On Prior Employment Probabilities: Men
Separate Models for Increasing and Decreasing Minimum Wage Year Pairs**

	Coefficient	Coefficient Std. Error	P(Emp _t =1)	Share of Employed at t+1	Elasticity	Elasticity Std. Error
<i>United States - Increasing Real Minimum Year Pairs</i>						
Between* rmiw _t -rmiw _{t+1}	-4.1420	(1.2974)	0.7535	0.0336	-1.0209	(0.3198)
Marginal* rmiw _t -rmiw _{t+1}	-3.1563	(1.2660)	0.7920	0.0412	-0.6564	(0.2633)
Difference in Coefficients or Elasticities	-0.9857	(1.5224)	Observations = 27431		-0.3645	(0.3492)
<i>United States - Decreasing Real Minimum Year Pairs</i>						
Between*(rmiw _t -rmiw _{t+1})	-3.0107	(0.9773)	0.7370	0.0574	-0.7917	(0.2570)
Marginal*(rmiw _t -rmiw _{t+1})	-0.6788	(1.1714)	0.7691	0.0411	-0.1567	(0.2705)
Difference in Coefficients or Elasticities	-2.3319	(1.2500)	Observations = 98114		-0.6350	(0.3046)
Difference in Difference ($\Delta_{\text{Decreasing}} - \Delta_{\text{Increasing}}$)	-1.3462	(1.9699)			-0.2705	(0.4634)
<i>France - Increasing Real Minimum Year Pairs (t= 1990-1992)</i>						
Between* rmiw _t -rmiw _{t+1}	-9.5803	(3.5757)	0.7684	0.0302	-2.2188	(0.8281)
Marginal* rmiw _t -rmiw _{t+1}	-7.4221	(3.1980)	0.8282	0.0491	-1.2751	(0.5494)
Difference in Coefficients or Elasticities	-2.1582	(4.2707)	Observations = 38643		-0.9437	(0.8942)
<i>France - Decreasing Real Minimum Year Pairs (t=1995)</i>						
Between*(rmiw _t -rmiw _{t+1})	-4.3359	(1.7675)	0.7296	0.0388	-1.1724	(0.4779)
Marginal*(rmiw _t -rmiw _{t+1})	-2.9819	(2.2701)	0.8395	0.0305	-0.4786	(0.3643)
Difference in Coefficients or Elasticities	-1.3540	(2.6230)	Observations = 13661		-0.6938	(0.3949)
Difference in Difference ($\Delta_{\text{Decreasing}} - \Delta_{\text{Increasing}}$)	0.8043	(5.0119)			0.2499	(0.9775)
Sources and notes: see Table 1.						

Table 4

**Estimated Effect of Real Minimum Wage Changes On Prior Employment Probabilities: Women
Separate Models for Increasing and Decreasing Minimum Wage Year Pairs**

	Coefficient	Coefficient Std. Error	P(Emp _t =1)	Share of Employed at t+1	Elasticity	Elasticity Std. Error
<i>United States - Increasing Real Minimum Year Pairs</i>						
Between* rmiw _t -rmiw _{t+1}	-5.0426	(0.8558)	0.6829	0.0582	-1.5991	(0.2714)
Marginal* rmiw _t -rmiw _{t+1}	-3.6934	(0.7907)	0.7194	0.0772	-1.0363	(0.2219)
Difference in Coefficients or Elasticities	-1.3492	(0.9620)	Observations = 30379		-0.5628	(0.2906)
<i>United States - Decreasing Real Minimum Year Pairs</i>						
Between*(rmiw _t -rmiw _{t+1})	-7.0349	(0.6634)	0.6264	0.0992	-2.6281	(0.2478)
Marginal*(rmiw _t -rmiw _{t+1})	-5.3875	(0.7160)	0.6681	0.0800	-1.7884	(0.2377)
Difference in Coefficients or Elasticities	-1.6474	(0.7617)	Observations = 101987		-0.8397	(0.2678)
Difference in Difference ($\Delta_{\text{Decreasing}} - \Delta_{\text{Increasing}}$)	-0.2982	(1.2271)			-0.2770	(0.3951)
<i>France - Increasing Real Minimum Year Pairs (t= 1990-1992)</i>						
Between* rmiw _t -rmiw _{t+1}	0.9506	(2.7829)	0.8155	0.0821	0.1754	(0.5134)
Marginal* rmiw _t -rmiw _{t+1}	3.7448	(2.8928)	0.8708	0.1043	0.4838	(0.3737)
Difference in Coefficients or Elasticities	-2.7942	(3.5967)	Observations = 26458		-0.3084	(0.5391)
<i>France - Decreasing Real Minimum Year Pairs (t=1995)</i>						
Between*(rmiw _t -rmiw _{t+1})	-0.9877	(1.3912)	0.8151	0.0721	-0.1826	(0.2572)
Marginal*(rmiw _t -rmiw _{t+1})	1.7415	(1.8887)	0.8870	0.1098	0.1968	(0.2134)
Difference in Coefficients or Elasticities	-2.7292	(2.1088)	Observations = 9891		-0.3794	(0.1136)
Difference in Difference ($\Delta_{\text{Decreasing}} - \Delta_{\text{Increasing}}$)	0.0650	(4.1693)			-0.0710	(0.5509)
Sources and notes: see Table 1.						

Table 5						
Estimated Effect of Real Minimum Wage Changes On Subsequent Employment Probabilities: Men Symmetric and Asymmetric Models for Pooled Increasing and Decreasing Minimum Wage Year Pairs Without Indicator Variables for Position in Wage Distribution						
	Coefficient	Coefficient Std. Error	P(Emp _{t+1} =1)	Share of Employed at t	Elasticity	Elasticity Std. Error
<i>United States - All Year Pairs, Identical Coefficients</i>						
Between*(rmiw _{t+1} -rmiw _t)	0.4236	(0.6620)	0.7915	0.0694	0.0883	(0.1380)
Marginal*(rmiw _{t+1} -rmiw _t)	-0.4592	(1.0318)	0.8157	0.0263	-0.0846	(0.1902)
Difference in Coefficients or Elasticities	0.8827	(1.1779)	Observations = 122521		0.1730	(0.2254)
<i>United States - All Year Pairs, Different Coefficients</i>						
Decreasing*Between* rmiw _{t+1} -rmiw _t	-2.8752	(0.9593)	0.7932	0.0592	-0.5947	(0.1984)
Decreasing*Marginal* rmiw _{t+1} -rmiw _t	-1.4580	(1.3331)	0.8181	0.0221	-0.2651	(0.2424)
Difference in Coefficients or Elasticities	-1.4172	(1.4306)			-0.3295	(0.2714)
Increasing*Between*(rmiw _{t+1} -rmiw _t)	-3.0136	(1.1061)	0.7816	0.0101	-0.6581	(0.2416)
Increasing*Marginal*(rmiw _{t+1} -rmiw _t)	-3.0019	(1.7188)	0.8024	0.0041	-0.5933	(0.3397)
Difference in Coefficients or Elasticities	-0.0117	(1.9505)			-0.0648	(0.3970)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	1.4055	(2.6798)	Observations = 122521		0.2647	(0.5277)
<i>France - All Year Pairs, Identical Coefficients (t=1990-1993, 1995, 1997)</i>						
Between*(rmiw _{t+1} -rmiw _t)	-2.6714	(1.4819)	0.8541	0.0312	-0.3898	(0.2162)
Marginal*(rmiw _{t+1} -rmiw _t)	0.1307	(1.3645)	0.8903	0.0537	0.0143	(0.1497)
Difference in Coefficients or Elasticities	-2.8021	(1.9096)	Observations = 79540		-0.4041	(0.2506)
<i>France - All Year Pairs, Different Coefficients (t=1990-1993, 1995, 1997)</i>						
Decreasing*Between* rmiw _{t+1} -rmiw _t	-3.9086	(2.3313)	0.8645	0.0128	-0.5296	(0.3159)
Decreasing*Marginal* rmiw _{t+1} -rmiw _t	-4.5026	(2.3055)	0.8916	0.0196	-0.4881	(0.2499)
Difference in Coefficients or Elasticities	0.5940	(2.1248)			-0.0415	(0.3889)
Increasing*Between*(rmiw _{t+1} -rmiw _t)	-18.8925	(4.9914)	0.8469	0.0184	-2.8924	(0.7642)
Increasing*Marginal*(rmiw _{t+1} -rmiw _t)	-10.6251	(4.8887)	0.8897	0.0341	-1.1719	(2.2445)
Difference in Coefficients or Elasticities	-8.2674	(3.8252)			-1.7205	(0.9140)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	-8.8614	(4.3704)	Observations = 79540		-1.6790	(0.9569)
Sources and notes: see Table 1.						

Table 6						
Estimated Effect of Real Minimum Wage Changes On Subsequent Employment Probabilities: Women Symmetric and Asymmetric Models for Pooled Increasing and Decreasing Minimum Wage Year Pairs Without Indicator Variables for Position in Wage Distribution						
	Coefficient	Coefficient Std. Error	P(Emp _{t+1} =1)	Share of Employed at t	Elasticity	Elasticity Std. Error
<i>United States - All Year Pairs, Identical Coefficients</i>						
Between*(rmiw _{t+1} -rmiw _t)	1.7071	(0.4248)	0.7207	0.1276	0.4768	(0.1187)
Marginal*(rmiw _{t+1} -rmiw _t)	1.1161	(0.5745)	0.7544	0.0626	0.2741	(0.1411)
Difference in Coefficients or Elasticities	0.5910	(0.6677)	Observations = 128187		0.2027	(0.1719)
<i>United States - All Year Pairs, Different Coefficients</i>						
Decreasing*Between* rmiw _{t+1} -rmiw _t	-3.8974	(0.6158)	0.7182	0.1091	-1.0982	(0.1735)
Decreasing*Marginal* rmiw _{t+1} -rmiw _t	-2.3395	(0.7533)	0.7511	0.0532	-0.5823	(0.1875)
Difference in Coefficients or Elasticities	-1.5579	(0.8063)			-0.5159	(0.2109)
Increasing*Between*(rmiw _{t+1} -rmiw _t)	-1.6143	(0.7244)	0.7352	0.0185	-0.4274	(0.1918)
Increasing*Marginal*(rmiw _{t+1} -rmiw _t)	-0.2712	(0.9852)	0.7731	0.0094	-0.0615	(0.2236)
Difference in Coefficients or Elasticities	-1.3431	(1.1506)			-0.3658	(0.2765)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	0.2148	(1.5943)	Observations = 128187		0.1501	(0.3892)
<i>France - All Year Pairs, Identical Coefficients (t=1990-1993, 1995, 1997)</i>						
Between*(rmiw _{t+1} -rmiw _t)	-1.2298	(1.1853)	0.8576	0.0796	-0.1751	(0.1688)
Marginal*(rmiw _{t+1} -rmiw _t)	1.1230	(1.2096)	0.8903	0.1043	0.1232	(0.1327)
Difference in Coefficients or Elasticities	-2.3528	(1.5098)	Observations = 55086		-0.2983	(0.1997)
<i>France - All Year Pairs, Different Coefficients (t=1990-1993, 1995, 1997)</i>						
Decreasing*Between* rmiw _{t+1} -rmiw _t	-1.8828	(1.9665)	0.8696	0.0326	-0.2455	(0.2564)
Decreasing*Marginal* rmiw _{t+1} -rmiw _t	-1.2018	(2.0330)	0.8903	0.0377	-0.1318	(0.2230)
Difference in Coefficients or Elasticities	-0.6810	(1.7155)			-0.1137	(0.3238)
Increasing*Between*(rmiw _{t+1} -rmiw _t)	-7.9714	(4.0455)	0.8492	0.0470	-1.2021	(0.6101)
Increasing*Marginal*(rmiw _{t+1} -rmiw _t)	1.8768	(4.1710)	0.8902	0.0666	0.2061	(0.4580)
Difference in Coefficients or Elasticities	-9.8482	(3.0479)			-1.4082	(0.7372)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	-9.1672	(3.4927)	Observations = 55086		-1.2945	(0.7749)
Sources and notes: see Table 1.						

Table 7						
Estimated Effect of Real Minimum Wage Changes On Prior Employment Probabilities: Men						
Symmetric and Asymmetric Models for Pooled Increasing and Decreasing Minimum Wage Year Pairs						
Without Indicator Variables for Position in Wage Distribution						
	Coefficient	Coefficient Std. Error	P(Emp _t =1)	Share of Employed at t+1	Elasticity	Elasticity Std. Error
<i>United States - All Year Pairs, Identical Coefficients</i>						
Between*(rmiw _t -rmiw _{t+1})	0.4473	(0.6845)	0.7394	0.0522	0.1166	(0.1784)
Marginal*(rmiw _t -rmiw _{t+1})	2.0172	(0.7663)	0.7741	0.0411	0.4556	(0.1731)
Difference in Coefficients or Elasticities	-1.5699	(0.9790)	Observations = 125545		-0.3391	(0.2368)
<i>United States - All Year Pairs, Different Coefficients</i>						
Decreasing*Between*(rmiw _t -rmiw _{t+1})	-2.6259	(0.9396)	0.7370	0.0449	-0.6905	(0.2471)
Decreasing*Marginal*(rmiw _t -rmiw _{t+1})	-0.3061	(1.1421)	0.7691	0.0321	-0.0707	(0.2637)
Difference in Coefficients or Elasticities	-2.3198	(1.2482)			-0.6198	(0.3039)
Increasing*Between* rmiw _t -rmiw _{t+1}	-5.1346	(1.1261)	0.7535	0.0073	-1.2655	(0.2775)
Increasing*Marginal* rmiw _t -rmiw _{t+1}	-4.0017	(1.1191)	0.7920	0.0090	-0.8322	(0.2327)
Difference in Coefficients or Elasticities	-1.1329	(1.4965)			-0.4333	(0.3418)
Difference in Difference (Δ_{Decreasing}-Δ_{Increasing})	-1.1869	(2.2187)	Observations = 125545		-0.1865	(0.5137)
<i>France - All Year Pairs, Identical Coefficients (t=1993, 1995-1997)</i>						
Between*(rmiw _t -rmiw _{t+1})	-3.1728	(1.5212)	0.8221	0.0420	-0.5644	(0.2706)
Marginal*(rmiw _t -rmiw _{t+1})	-0.7774	(1.9042)	0.8651	0.0420	-0.1049	(0.2569)
Difference in Coefficients or Elasticities	-2.3954	(2.2891)	Observations = 53748		-0.4596	(0.3499)
<i>France - All Year Pairs, Different Coefficients (t=1993, 1995-1997)</i>						
Decreasing*Between*(rmiw _t -rmiw _{t+1})	-4.9491	(1.6410)	0.7414	0.0144	-1.2798	(0.4244)
Decreasing*Marginal*(rmiw _t -rmiw _{t+1})	-2.6241	(2.0485)	0.8299	0.0178	-0.4464	(0.3485)
Difference in Coefficients or Elasticities	-2.3249	(2.4197)			-0.8335	(0.5060)
Increasing*Between* rmiw _t -rmiw _{t+1}	-8.9217	(4.7074)	0.8643	0.0275	-1.2107	(0.6388)
Increasing*Marginal* rmiw _t -rmiw _{t+1}	-9.8952	(5.2913)	0.8911	0.0241	-1.0776	(0.5762)
Difference in Coefficients or Elasticities	0.9736	(6.3358)			-0.1331	(0.7695)
Difference in Difference (Δ_{Decreasing}-Δ_{Increasing})	-3.2985	(6.7831)	Observations = 53748		-0.7004	(0.8776)
Sources and notes: see Table 1.						

Table 8						
Estimated Effect of Real Minimum Wage Changes On Prior Employment Probabilities: Women						
Symmetric and Asymmetric Models for Pooled Increasing and Decreasing Minimum Wage Year Pairs						
Without Indicator Variables for Position in Wage Distribution						
	Coefficient	Coefficient Std. Error	P(Emp _t =1)	Share of Employed at t+1	Elasticity	Elasticity Std. Error
<i>United States - All Year Pairs, Identical Coefficients</i>						
Between*(rmiw _t -rmiw _{t+1})	-2.9120	(0.4561)	0.6348	0.0898	-1.0634	(0.1665)
Marginal*(rmiw _t -rmiw _{t+1})	-1.5489	(0.4775)	0.6795	0.0794	-0.4964	(0.1530)
Difference in Coefficients or Elasticities	-1.3631	(0.6154)	Observations = 132366		-0.5670	(0.2108)
<i>United States - All Year Pairs, Different Coefficients</i>						
Decreasing*Between*(rmiw _t -rmiw _{t+1})	-7.4694	(0.6347)	0.6264	0.0765	-2.7904	(0.2371)
Decreasing*Marginal*(rmiw _t -rmiw _{t+1})	-5.8111	(0.6951)	0.6681	0.0617	-1.9290	(0.2307)
Difference in Coefficients or Elasticities	-1.6583	(0.7593)			-0.8615	(0.2666)
Increasing*Between* rmiw _t -rmiw _{t+1}	-4.1371	(0.7541)	0.6829	0.0134	-1.3120	(0.2391)
Increasing*Marginal* rmiw _t -rmiw _{t+1}	-2.7209	(0.7053)	0.7194	0.0177	-0.7635	(0.1979)
Difference in Coefficients or Elasticities	-1.4163	(0.9569)			-0.5485	(0.2880)
Difference in Difference (Δ_{Decreasing}-Δ_{Increasing})	-0.2420	(1.4034)	Observations = 132366		-0.3129	(0.4466)
<i>France - All Year Pairs, Identical Coefficients (t=1993, 1995-1997)</i>						
Between*(rmiw _t -rmiw _{t+1})	1.1524	(1.2726)	0.8383	0.0869	0.1863	(0.2058)
Marginal*(rmiw _t -rmiw _{t+1})	4.0681	(1.6707)	0.8805	0.0768	0.4861	(0.1997)
Difference in Coefficients or Elasticities	-2.9157	(1.9039)	Observations = 39154		-0.2998	(0.2621)
<i>France - All Year Pairs, Different Coefficients (t=1993, 1995-1997)</i>						
Decreasing*Between*(rmiw _t -rmiw _{t+1})	2.5248	(1.4028)	0.8136	0.0411	0.4706	(0.2615)
Decreasing*Marginal*(rmiw _t -rmiw _{t+1})	5.2705	(1.8266)	0.8698	0.0431	0.6862	(0.2378)
Difference in Coefficients or Elasticities	-2.7457	(2.0196)			-0.2156	(0.3160)
Increasing*Between* rmiw _t -rmiw _{t+1}	8.8004	(4.5768)	0.8604	0.0458	1.2285	(0.6389)
Increasing*Marginal* rmiw _t -rmiw _{t+1}	2.8664	(5.4091)	0.8943	0.0336	0.3030	(0.5717)
Difference in Coefficients or Elasticities	5.9341	(6.2527)			0.9256	(0.7664)
Difference in Difference (Δ_{Decreasing}-Δ_{Increasing})	-8.6798	(6.5708)	Observations = 39154		-1.1412	(0.7992)
Sources and notes: see Table 1.						

Table 9						
Estimated Effect of Real Minimum Wage Changes On Subsequent Employment Probabilities: Men						
Symmetric and Asymmetric Models for Pooled Increasing and Decreasing Minimum Wage Year Pairs						
With Indicator Variables for Position in Wage Distribution						
	Coefficient	Coefficient Std. Error	P(Emp _{t+1} =1)	Share of Employed at t	Elasticity	Elasticity Std. Error
<i>United States - All Year Pairs, Identical Coefficients</i>						
Between	-0.1631	(0.0444)	0.7915	0.0694	-0.0340	(0.0093)
Marginal	-0.1099	(0.0608)	0.8157	0.0263	-0.0203	(0.0112)
Difference in Coefficients or Elasticities	-0.0532	(0.0644)			-0.0138	(0.0124)
Between*(rmiw _{t+1} -rmiw _t)	-0.7990	(0.7099)	0.7915	0.0694	-0.1666	(0.1480)
Marginal*(rmiw _{t+1} -rmiw _t)	-1.1809	(1.1458)	0.8157	0.0263	-0.2177	(0.2112)
Difference in Coefficients or Elasticities	0.3819	(1.3211)	Observations = 122521		0.0511	(0.2525)
<i>United States - All Year Pairs, Different Coefficients</i>						
Between	-0.1393	(0.1226)	0.7915	0.0694	-0.0290	(0.0256)
Marginal	0.0351	(0.1808)	0.8157	0.0263	0.0065	(0.0333)
Difference in Coefficients or Elasticities	-0.1744	(0.2087)			-0.0355	(0.0401)
Decreasing*Between* rmiw _{t+1} -rmiw _t	0.2576	(2.7903)	0.7932	0.0592	0.0533	(0.5771)
Decreasing*Marginal* rmiw _{t+1} -rmiw _t	-2.2415	(4.1795)	0.8181	0.0221	-0.4076	(0.7600)
Difference in Coefficients or Elasticities	2.4991	(4.8785)			0.4609	(0.9252)
Increasing*Between*(rmiw _{t+1} -rmiw _t)	-1.1405	(1.9043)	0.7816	0.0101	-0.2491	(0.4159)
Increasing*Marginal*(rmiw _{t+1} -rmiw _t)	-3.4746	(2.9352)	0.8024	0.0041	-0.6867	(0.5801)
Difference in Coefficients or Elasticities	2.3340	(3.4161)			0.4376	(0.6962)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	-0.1650	(3.0495)	Observations = 122521		-0.0233	(0.5729)
<i>France - All Year Pairs, Identical Coefficients (t=1990-1993, 1995, 1997)</i>						
Between	-0.3844	(0.0671)	0.8541	0.0312	-0.0561	(0.0098)
Marginal	-0.2159	(0.0574)	0.8903	0.0537	-0.0237	(0.0063)
Difference in Coefficients or Elasticities	-0.1685	(0.0799)			-0.0324	(0.0106)
Between*(rmiw _{t+1} -rmiw _t)	-2.6714	(1.4819)	0.8541	0.0312	-0.3898	(0.2162)
Marginal*(rmiw _{t+1} -rmiw _t)	0.1307	(1.3645)	0.8903	0.0537	0.0143	(0.1497)
Difference in Coefficients or Elasticities	-2.8021	(1.9096)	Observations = 79540		-0.4041	(0.2501)
<i>France - All Year Pairs, Different Coefficients (t=1990-1993, 1995, 1997)</i>						
Between	-0.0893	(0.1740)	0.8541	0.0312	-0.0130	(0.0254)
Marginal	0.0807	(0.1401)	0.8903	0.0537	0.0089	(0.0154)
Difference in Coefficients or Elasticities	-0.1700	(0.2135)			-0.0219	(0.0285)
Decreasing*Between* rmiw _{t+1} -rmiw _t	-2.3615	(3.0316)	0.8645	0.0128	-0.3200	(0.4108)
Decreasing*Marginal* rmiw _{t+1} -rmiw _t	-5.4771	(2.6127)	0.8916	0.0196	-0.5937	(0.2832)
Difference in Coefficients or Elasticities	3.1156	(3.8158)			0.2737	(0.4770)
Increasing*Between*(rmiw _{t+1} -rmiw _t)	-15.1407	(6.8397)	0.8469	0.0184	-2.3180	(1.0472)
Increasing*Marginal*(rmiw _{t+1} -rmiw _t)	-12.9763	(5.7311)	0.8897	0.0341	-1.4313	(0.6321)
Difference in Coefficients or Elasticities	-2.1644	(8.5682)			-0.8868	(1.1795)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	-5.2800	(6.2718)	Observations = 79540		-1.1605	(1.2273)
Sources and notes: see Table 1.						

Table 10						
Estimated Effect of Real Minimum Wage Changes On Subsequent Employment Probabilities: Women						
Symmetric and Asymmetric Models for Pooled Increasing and Decreasing Minimum Wage Year Pairs						
With Indicator Variables for Position in Wage Distribution						
	Coefficient	Coefficient Std. Error	P(Emp _{t+1} =1)	Share of Employed at t	Elasticity	Elasticity Std. Error
<i>United States - All Year Pairs, Identical Coefficients</i>						
Between	-0.1523	(0.0292)	0.7207	0.1276	-0.0425	(0.0081)
Marginal	-0.0736	(0.0352)	0.7544	0.0626	-0.0181	(0.0087)
Difference in Coefficients or Elasticities	-0.0786	(0.0379)			-0.0244	(0.0098)
Between*(rmiw _{t+1} -rmiw _t)	0.3979	(0.4642)	0.7207	0.1276	0.1111	(0.1297)
Marginal*(rmiw _{t+1} -rmiw _t)	0.6326	(0.6530)	0.7544	0.0626	0.1554	(0.1604)
Difference in Coefficients or Elasticities	-0.2347	(0.7701)	Observations = 128187		-0.0442	(0.1979)
<i>United States - All Year Pairs, Different Coefficients</i>						
Between	-0.1779	(0.0806)	0.7207	0.1276	-0.0497	(0.0225)
Marginal	-0.1014	(0.0998)	0.7544	0.0626	-0.0249	(0.0245)
Difference in Coefficients or Elasticities	-0.0764	(0.1174)			-0.0248	(0.0304)
Decreasing*Between* rmiw _{t+1} -rmiw _t	0.2402	(1.8315)	0.7182	0.1091	0.0677	(0.5161)
Decreasing*Marginal* rmiw _{t+1} -rmiw _t	0.0431	(2.3074)	0.7511	0.0532	0.0107	(0.5743)
Difference in Coefficients or Elasticities	0.1971	(2.7300)			0.0569	(0.7143)
Increasing*Between*(rmiw _{t+1} -rmiw _t)	0.8668	(1.2394)	0.7352	0.0185	0.2295	(0.3281)
Increasing*Marginal*(rmiw _{t+1} -rmiw _t)	1.1311	(1.5992)	0.7731	0.0094	0.2567	(0.3629)
Difference in Coefficients or Elasticities	-0.2643	(1.9196)			-0.0272	(0.4635)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	-0.4613	(1.7681)	Observations = 128187		-0.0841	(0.4658)
<i>France - All Year Pairs, Identical Coefficients (t=1990-1993, 1995, 1997)</i>						
Between	-0.3827	(0.0528)	0.8576	0.0796	-0.0545	(0.0075)
Marginal	-0.2083	(0.0504)	0.8903	0.1043	-0.0229	(0.0055)
Difference in Coefficients or Elasticities	-0.1744	(0.0625)			-0.0316	(0.0081)
Between*(rmiw _{t+1} -rmiw _t)	-1.2298	(1.1853)	0.8576	0.0796	-0.1751	(0.1688)
Marginal*(rmiw _{t+1} -rmiw _t)	1.1230	(1.2096)	0.8903	0.1043	0.1232	(0.1327)
Difference in Coefficients or Elasticities	-2.3528	(1.5098)	Observations = 55086		-0.2983	(0.0469)
<i>France - All Year Pairs, Different Coefficients (t=1990-1993, 1995, 1997)</i>						
Between	-0.2066	(0.1325)	0.8576	0.0796	-0.0269	(0.0173)
Marginal	-0.2252	(0.1173)	0.8903	0.1043	-0.0247	(0.0129)
Difference in Coefficients or Elasticities	0.0186	(0.1610)			-0.0022	(0.0197)
Decreasing*Between* rmiw _{t+1} -rmiw _t	-2.0411	(2.3996)	0.8696	0.0326	-0.3078	(0.3619)
Decreasing*Marginal* rmiw _{t+1} -rmiw _t	-1.0782	(2.2989)	0.8903	0.0377	-0.1184	(0.2524)
Difference in Coefficients or Elasticities	-0.9629	(2.9893)			-0.1894	(0.3997)
Increasing*Between*(rmiw _{t+1} -rmiw _t)	-8.3455	(5.1916)	0.8492	0.0470	-1.2585	(0.7829)
Increasing*Marginal*(rmiw _{t+1} -rmiw _t)	2.1728	(4.8982)	0.8902	0.0666	0.2386	(0.5378)
Difference in Coefficients or Elasticities	-10.5183	(6.5711)			-1.4971	(0.8795)
Difference in Difference ($\Delta_{\text{Increasing}} - \Delta_{\text{Decreasing}}$)	-9.5554	(4.8559)	Observations = 55086		-1.3077	(0.9290)
Sources and notes: see Table 1.						

Table 11						
Estimated Effect of Real Minimum Wage Changes On Prior Employment Probabilities: Men						
Symmetric and Asymmetric Models for Pooled Increasing and Decreasing Minimum Wage Year Pairs						
With Indicator Variables for Position in Wage Distribution						
	Coefficient	Coefficient Std. Error	P(Emp _t =1)	Share of Employed at t+1	Elasticity	Elasticity Std. Error
<i>United States - All Year Pairs, Identical Coefficients</i>						
Between	-0.2527	(0.0444)	0.7394	0.0522	-0.0659	(0.0116)
Marginal	-0.1182	(0.0444)	0.7741	0.0411	-0.0267	(0.0100)
Difference in Coefficients or Elasticities	-0.1345	(0.0517)			-0.0392	(0.0126)
Between*(rmiw _t -rmiw _{t+1})	2.4999	(0.7373)	0.7394	0.0522	0.6516	(0.1922)
Marginal*(rmiw _t -rmiw _{t+1})	2.4303	(0.7888)	0.7741	0.0411	0.5490	(0.1782)
Difference in Coefficients or Elasticities	0.0696	(1.0488)	Observations = 125545		0.1026	(0.2546)
<i>United States - All Year Pairs, Different Coefficients</i>						
Between	-0.4534	(0.1283)	0.7394	0.0522	-0.1182	(0.0334)
Marginal	-0.0385	(0.1498)	0.7741	0.0411	-0.0087	(0.0338)
Difference in Coefficients or Elasticities	-0.4149	(0.1869)			-0.1095	(0.0450)
Decreasing*Between*(rmiw _t -rmiw _{t+1})	7.1404	(2.8854)	0.7370	0.0449	1.8776	(0.7588)
Decreasing*Marginal*(rmiw _t -rmiw _{t+1})	0.3864	(3.7156)	0.7691	0.0321	0.0892	(0.8579)
Difference in Coefficients or Elasticities	6.7540	(4.5370)			1.7884	(1.1036)
Increasing*Between* rmiw _t -rmiw _{t+1}	0.5359	(1.9607)	0.7535	0.0073	0.1321	(0.4833)
Increasing*Marginal* rmiw _t -rmiw _{t+1}	-3.6283	(2.2513)	0.7920	0.0090	-0.7546	(0.4682)
Difference in Coefficients or Elasticities	4.1642	(2.8924)			0.8866	(0.6517)
Difference in Difference ($\Delta_{\text{Decreasing}} - \Delta_{\text{Increasing}}$)	2.5898	(2.7242)	Observations = 125545		0.9018	(0.6854)
<i>France - All Year Pairs, Identical Coefficients (t=1993, 1995-1997)</i>						
Between	-0.2648	(0.0842)	0.8221	0.0420	-0.0471	(0.0150)
Marginal	-0.1775	(0.0886)	0.8651	0.0420	-0.0239	(0.0120)
Difference in Coefficients or Elasticities	-0.0873	(0.1075)			-0.0232	(0.0169)
Between*(rmiw _t -rmiw _{t+1})	-1.4906	(1.6024)	0.8221	0.0420	-0.2652	(0.2851)
Marginal*(rmiw _t -rmiw _{t+1})	0.4239	(2.0033)	0.8651	0.0420	0.0572	(0.2702)
Difference in Coefficients or Elasticities	-1.9145	(2.4093)	Observations = 53748		-0.3224	(0.3683)
<i>France - All Year Pairs, Different Coefficients (t=1993, 1995-1997)</i>						
Between	-0.5607	(0.2829)	0.8221	0.0420	-0.0997	(0.0503)
Marginal	0.0216	(0.2286)	0.8651	0.0420	0.0029	(0.0308)
Difference in Coefficients or Elasticities	-0.5823	(0.3441)			-0.1027	(0.0561)
Decreasing*Between*(rmiw _t -rmiw _{t+1})	2.7370	(4.2196)	0.7414	0.0144	0.7078	(1.0912)
Decreasing*Marginal*(rmiw _t -rmiw _{t+1})	-3.0917	(4.1713)	0.8299	0.0178	-0.5259	(0.7095)
Difference in Coefficients or Elasticities	5.8287	(5.6343)			1.2337	(1.2418)
Increasing*Between* rmiw _t -rmiw _{t+1}	15.8316	(13.3360)	0.8643	0.0275	2.1484	(1.8097)
Increasing*Marginal* rmiw _t -rmiw _{t+1}	-10.9886	(11.3990)	0.8911	0.0241	-1.1967	(1.2413)
Difference in Coefficients or Elasticities	26.8203	(16.5923)			3.3450	(2.0823)
Difference in Difference ($\Delta_{\text{Decreasing}} - \Delta_{\text{Increasing}}$)	-20.9915	(12.3036)	Observations = 53748		-2.1113	(2.3153)

Sources and notes: see Table 1.

Table 12						
Estimated Effect of Real Minimum Wage Changes On Prior Employment Probabilities: Women						
Symmetric and Asymmetric Models for Pooled Increasing and Decreasing Minimum Wage Year Pairs						
With Indicator Variables for Position in Wage Distribution						
	Coefficient	Coefficient Std. Error	P(Emp _t =1)	Share of Employed at t+1	Elasticity	Elasticity Std. Error
<i>United States - All Year Pairs, Identical Coefficients</i>						
Between	-0.3691	(0.0301)	0.6348	0.0898	-0.1348	(0.0110)
Marginal	-0.2553	(0.0283)	0.6795	0.0794	-0.0818	(0.0091)
Difference in Coefficients or Elasticities	-0.1139	(0.0328)			-0.0530	(0.0114)
Between*(rmiw _t -rmiw _{t+1})	0.1147	(0.4918)	0.6348	0.0898	0.0419	(0.1796)
Marginal*(rmiw _t -rmiw _{t+1})	-0.3034	(0.4863)	0.6795	0.0794	-0.0972	(0.1559)
Difference in Coefficients or Elasticities	0.4181	(0.6585)	Observations = 132366		0.1391	(0.2265)
<i>United States - All Year Pairs, Different Coefficients</i>						
Between	-0.5808	(0.0863)	0.6348	0.0898	-0.2121	(0.0315)
Marginal	-0.3763	(0.0902)	0.6795	0.0794	-0.1206	(0.0289)
Difference in Coefficients or Elasticities	-0.2045	(0.1141)			-0.0915	(0.0391)
Decreasing*Between*(rmiw _t -rmiw _{t+1})	4.9795	(1.9307)	0.6264	0.0765	1.8602	(0.7213)
Decreasing*Marginal*(rmiw _t -rmiw _{t+1})	2.6703	(2.1643)	0.6681	0.0617	0.8864	(0.7184)
Difference in Coefficients or Elasticities	2.3092	(2.6962)			0.9738	(0.9459)
Increasing*Between* rmiw _t -rmiw _{t+1}	3.0630	(1.3115)	0.6829	0.0134	0.9714	(0.4159)
Increasing*Marginal* rmiw _t -rmiw _{t+1}	2.0891	(1.3758)	0.7194	0.0177	0.5862	(0.3861)
Difference in Coefficients or Elasticities	0.9740	(1.7950)			0.3852	(0.5359)
Difference in Difference ($\Delta_{\text{Decreasing}} - \Delta_{\text{Increasing}}$)	-1.3352	(1.6294)	Observations = 132366		0.5887	(0.6029)
<i>France - All Year Pairs, Identical Coefficients (t=1993, 1995-1997)</i>						
Between	0.2239	(0.0786)	0.8383	0.0869	0.0362	(0.0127)
Marginal	0.1940	(0.0867)	0.8805	0.0768	0.0232	(0.0104)
Difference in Coefficients or Elasticities	0.0299	(0.0991)			0.0130	(0.0139)
Between*(rmiw _t -rmiw _{t+1})	-0.3271	(1.4024)	0.8383	0.0869	-0.0529	(0.2268)
Marginal*(rmiw _t -rmiw _{t+1})	2.6546	(1.8527)	0.8805	0.0768	0.3172	(0.2214)
Difference in Coefficients or Elasticities	-2.9817	(2.1476)	Observations = 39154		-0.3701	(0.2919)
<i>France - All Year Pairs, Different Coefficients (t=1993, 1995-1997)</i>						
Between	0.3636	(0.2191)	0.8383	0.0869	0.0588	(0.0354)
Marginal	0.4230	(0.1985)	0.8805	0.0768	0.0506	(0.0237)
Difference in Coefficients or Elasticities	-0.0594	(0.2712)			0.0082	(0.0394)
Decreasing*Between*(rmiw _t -rmiw _{t+1})	-2.4636	(3.3364)	0.8136	0.0411	-0.4592	(0.6219)
Decreasing*Marginal*(rmiw _t -rmiw _{t+1})	-1.3851	(3.6329)	0.8698	0.0431	-0.1803	(0.4730)
Difference in Coefficients or Elasticities	-1.0785	(4.5475)			-0.2789	(0.7224)
Increasing*Between* rmiw _t -rmiw _{t+1}	-7.1150	(10.8790)	0.8604	0.0458	-0.9932	(1.5187)
Increasing*Marginal* rmiw _t -rmiw _{t+1}	-15.8151	(10.4148)	0.8943	0.0336	-1.6717	(1.1008)
Difference in Coefficients or Elasticities	8.7001	(14.0061)			0.6784	(1.7510)
Difference in Difference ($\Delta_{\text{Decreasing}} - \Delta_{\text{Increasing}}$)	-9.7787	(10.7114)	Observations = 39154		-0.9573	(1.8262)

Sources and notes: see Table 1.

IZA Discussion Papers

No.	Author(s)	Title	Area	Date
111	V. Sorm K. Terrell	Sectoral Restructuring and Labor Mobility: A Comparative Look at the Czech Republic	1/4	2/00
112	L. Bellmann T. Schank	Innovations, Wages and Demand for Heterogeneous Labour: New Evidence from a Matched Employer-Employee Data-Set	5	2/00
113	R. Euwals	Do Mandatory Pensions Decrease Household Savings? Evidence for the Netherlands	3	2/00
114	G. Brunello A. Medio	An Explanation of International Differences in Education and Workplace Training	2	2/00
115	A. Cigno F. C. Rosati	Why do Indian Children Work, and is it Bad for Them?	3	2/00
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121	J. C. van Ours	Do Active Labor Market Policies Help Unemployed Workers to Find and Keep Regular Jobs?	4/6	3/00
122	D. Munich J. Svejnar K. Terrell	Returns to Human Capital under the Communist Wage Grid and During the Transition to a Market Economy	4	3/00
123	J. Hunt	Why Do People Still Live in East Germany?	1	3/00
124	R. T. Riphahn	Rational Poverty or Poor Rationality? The Take-up of Social Assistance Benefits	3	3/00
125	F. Büchel J. R. Frick	The Income Portfolio of Immigrants in Germany - Effects of Ethnic Origin and Assimilation. Or: Who Gains from Income Re-Distribution?	1/3	3/00
126	J. Fersterer R. Winter-Ebmer	Smoking, Discount Rates, and Returns to Education	5	3/00

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130	G. Brunello S. Comi C. Lucifora	The Returns to Education in Italy: A New Look at the Evidence	5	3/00
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