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Pia Orrenius
Madeline Zavodny

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Pia Orrenius
Federal Reserve Bank of Dallas
and IZA

Madeline Zavodny
Agnes Scott College
and IZA

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IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

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ABSTRACT

The Minimum Wage and Latino Workers*

Latinos comprise a large and growing share of the low-skilled labor force in the U.S. and may be disproportionately affected by minimum wage laws as a result. We compare the effects of minimum wage laws on employment and earnings among Hispanic immigrants and natives compared with non-Hispanic whites and blacks. We focus on adults who have not finished high school and on teenagers, groups likely to earn low wages. Conventional economic theory predicts that higher minimum wages lead to higher hourly earnings among people who are employed but lower employment rates. Data from the Current Population Survey during the period 1994-2007 indicate that there is a significant disemployment effect of higher minimum wages on Latino teenagers, although it is smaller for foreign- than native-born Latinos. Adult Latino immigrants' earnings are less affected by minimum wage laws than other low-education natives, and their employment rates appear to increase when the minimum wage rises. We investigate whether skill levels and undocumented status help explain these findings.

JEL Classification: J23, J38, J15

Keywords: Latinos, Hispanics, minimum wage, low-skilled, immigrants

Corresponding author:

Pia Orrenius
Research Department
Federal Reserve Bank of Dallas
2200 N. Pearl Street
Dallas, TX 75201
USA
E-mail: Pia.Orrenius@dal.frb.org

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Introduction

Between 2007 and 2009, the federal minimum wage rose in three steps to $7.25 from $5.15. The increases were the first in a decade and were, in non-inflation adjusted terms, the largest rise in the minimum wage since its inception in 1938. It is important to understand how such a sizable increase might affect earnings and employment among low-skilled, low-wage workers. Because Latinos are the largest minority group in the U.S. and tend to have relatively low levels of education and earnings, this chapter focuses on how minimum wage laws affected Latino workers' employment and earnings, compared with non-Latinos, during the period 1994-2007.

Previous research suggests that minimum wage laws may have sizable effects among Latino teenagers and young adults. Neumark and Wascher (2007) indicate that higher minimum wages are associated with lower employment rates among Hispanics 16-24 years old, with the adverse employment effect increasing over time. Indeed, their results suggest that young Hispanics are more adversely affected than other racial and ethnic groups. Several studies also suggest that higher minimum wages are associated with more "idleness," or being neither enrolled in school nor working, among Hispanic and black teenagers (Neumark and Wascher 1996; Turner and Demiralp 2001).

Minimum wage laws may particularly affect Latinos because of relatively low average education levels and high rates of limited English proficiency (LEP).[1] As of 2006, about 41 percent of Hispanics – and 52 percent of foreign-born Hispanics – ages 25 and older in the U.S. did not have a high school diploma or equivalent. Less than 10

[1] Most U.S. data sets (including the ones we use here) ask individuals whether they are Hispanic, not Latino. We therefore treat the two as equivalent here. Individuals of Spanish ancestry might identify themselves as Hispanic but usually would not be considered Latinos, while individuals of Brazilian ancestry might not identify themselves as Hispanic but usually would be considered Latinos.

percent of non-Hispanic whites and 19 percent of blacks, in contrast, had not completed high school.[2] Data from the 2000 Census indicate that almost 82 percent of Hispanics aged 18-64 years old speak a language other than English at home, and almost 28 percent report that they speak English either "not well" or "not at all."[3]

This chapter assesses the incidence and impact of minimum wages on Latinos. We focus on Latino teenagers and low-education Latino adults because minimum wage laws will most likely affect these age/education groups. Although a few previous studies have examined the effect of minimum wages among Hispanics, most reported results that combined Hispanics with blacks. No previous research distinguished between Latino natives and immigrants, which we do here. Our examination of the effect of minimum wages on Latinos begins with an explanation of how minimum wages fit into a simple supply and demand model. We then discuss the data, which are from the Current Population Survey during 1994-2007, and our empirical methods.

The results indicate that the disemployment effect of higher minimum wages is smaller among foreign- than native-born Latino teenagers and is nonexistent for non-Hispanic white teens. Higher minimum wages do not adversely affect the employment rates of low-education adults. In fact, we find a *positive* employment effect for low-education foreign-and native-born Latino adults (and for whites). We investigate whether substitution across skill groups and undocumented status among immigrant Latinos underlie these results.

[2] Authors' calculations based on education statistics from Bureau of the Census data available at http://www.census.gov/population/www/socdemo/education/cps2006.html [accessed April 4, 2008].
[3] Authors' calculations based on summary tables from the Census 2000 Summary File (SF 3).

Theoretical Background

Conventional economic theory predicts that minimum wages raise hourly earnings and reduce employment. Figure 1 shows a simple version of this model. In the absence of a minimum wage, the labor market clears at the market wage, which is the wage at which the labor supply and labor demand curves intersect. In the figure, the number of workers employed at the market wage is labeled *Qm*. Imposing a "binding" minimum wage – one higher than the market clearing wage – reduces the number of workers hired to the quantity labeled *Qd* but increases the number of individuals who are willing to work to the quantity *Qs*. The decline in the number of people employed is given by the quantity *Qm – Qd*. The quantity *Qs – Qd* represents the number of people unemployed.

Further increases in the minimum wage would reduce the number of workers employed while raising the number of people who are unemployed. Economists usually focus on measuring the employment effect instead of unemployment since a higher minimum wage will cause people to enter the labor market, and not all of those workers will find jobs. The policy implications of this minimum wage-induced increase in unemployment are not clear. Moreover, unemployment statistics are misleading in that some people who cannot find a job stop searching and then are not counted as unemployed in official statistics.

The negative employment effect should be largest among workers who tend to earn low wages. Such workers usually are teenagers or young adults; many work at fast food restaurants. A number of studies have therefore focused on estimating the effect of minimum wage increases on employment among these groups and have typically found

that a 10 percent increase in the minimum wage leads to a 1 to 3 percent decline in employment.[4] However, some research suggests that higher minimum wages are not necessarily associated with lower employment rates even though they raise workers' average hourly earnings (e.g., Card 1992a, 1992b; Card, Katz, and Krueger 1994; Card and Krueger 1994; Katz and Krueger 1992). Such results contradict the conventional model. One potential explanation for these results is that employers substitute more-skilled workers for less-skilled workers as the minimum wage increases, resulting in no net change in aggregate employment but changes across groups.[5] If Latinos are viewed as less skilled than non-Hispanic whites, employers might substitute non-Hispanic whites for Latinos. Another possibility is that employment rates based on surveys of individuals remain unchanged despite minimum wage increases because some individuals work "under the table" for wages below the legal minimum.[6]

From a theoretical standpoint, the impact of minimum wages is likely to be larger among Latinos than among non-Hispanic whites. As discussed above, Latinos, particularly those who are foreign-born, tend to have less education than non-Hispanic whites. If firms reduce employment of low-skilled workers when the minimum wage increases, Latinos should be affected more than other groups. Foreign-born Latinos should be particularly adversely affected since they are likely to have less U.S. work experience than natives as well as limited English skills. On the other hand, immigrants – especially undocumented immigrants – may be more likely than natives to work "off the books" and therefore not be adversely affected by changes in labor laws like the

[4] For a survey, see Neumark and Wascher (2006).
[5] For formal models of the effects across skill levels of minimum wage increases, see, for example, Connolly (2003) and Lang and Kahn (1998).
[6] Another potential explanation is imperfectly competitive labor markets (monopsony). For an overview, see Zavodny (1998).

minimum wage. In a study of immigrants in the Chicago area in 2001, about 10 percent of undocumented immigrants (and 3 percent of legal immigrants) reported being paid less than the minimum wage (Mehta et al. 2002). About 90 percent of the undocumented immigrants were from Latin America.

In addition, the measured employment effect of higher minimum wages might be closer to zero among immigrants if those who cannot find work when the minimum wage increases respond by moving. These unemployed workers might return to their home country or move within the U.S. to an area that has a lower minimum wage (Orrenius and Zavodny 2008). Immigrants who are not naturalized U.S. citizens, and especially those illegally present in the U.S., have relatively little access to the public safety net (welfare benefits, unemployment insurance benefits, etc.). Because they have few alternatives, they are likely to move if they cannot find a job when the minimum wage rises.

Data

We use individual-level data to examine how minimum wage laws affect hourly earnings and employment during the period 1994 to 2007. The data are from the Current Population Survey, a large-scale survey conducted monthly among a representative random sample of households in the U.S. About 50,000 households per month participate in the survey and answer questions about household composition and demographic characteristics. Housing units are in the sample for four months, out for eight months, and then back in the sample for four months. When a housing unit is in the fourth and eighth survey waves (the outgoing rotations), the survey asks about individuals' employment status and earnings. Our data consist of individuals who are in these outgoing rotation

groups and who reported information about their demographic characteristics and labor market outcomes.

We constructed two samples from the outgoing rotation groups: teenagers and low-education adults. Teenagers are ages 16-19; low-education adults are ages 20-54 who do not have a high school diploma or equivalent. We focus on these groups since they tend to earn relatively low wages and hence are likely to be affected by minimum wage laws.

Our measure of the minimum wage is the higher of federal and state minimum wages (the "effective minimum wage") in each state. For simplicity and comparability to most previous studies, we do not examine federal and state "subminimum" wages (which allow employers to pay young or recently-hired workers a lower minimum wage); industry- or occupation-specific minimum wages (such as the tip credit minimum wage for some restaurant workers); city-level minimum wages (which occurred in a few areas toward the end of our sample period); or "living wage" requirements.[7] The federal minimum wage increased twice early in our sample period, from $4.25 to $4.75 in October 1996, to $5.15 in September 1997, and to $5.85 in July 2007.[8] Figure 2 shows the value of the real (inflation-adjusted) federal minimum wage during 1994-2007.

As inflation eroded the real value of the federal minimum wage, a number of states opted to pass higher minimum wages. The number of states with a minimum wage above the federal level at some point during the year ranges from a low of 8 in 1998 to a

[7] The tip credit specifies a lower minimum wage (currently $2.13 per hour) for employees who earn tips. When tips are included, the tipped workers must earn at least the legal minimum wage (currently $7.25 at the federal level). We also do not control for changes in the Earned Income Tax Credit (EITC) or for welfare reform, which might affect the incentive to work among low-skilled workers. The year fixed effects capture any national-level effects of changes in such factors. Neumark and Wascher (2007) examine the effects of minimum wages and the EITC among teens and young adults.

[8] Because the July 2007 increase went into effect on the 24th of that month, its direct effects would show up in the August 2007 survey (since the survey asks about the week that includes the 12th of the month).

high of 33 in 2007. We use the effective minimum wage on the 12th of the month in the year in which individuals completed the survey (because the reference period for the labor force questions is the week including the 12th).

Table 1 reports descriptive statistics for three groups: 1) workers who earn exactly the minimum wage, 2) workers who are paid less than the minimum wage, and 3) workers who earn within 125 percent of the minimum wage. The table also reports (in the last column) descriptive statistics for all workers as a benchmark.[9] About one-third of all workers earning exactly the minimum wage are teenagers. Teens account for a slightly lower, but still considerable, fraction of workers earning less than the minimum wage and slightly above the minimum wage. About 27 percent, 16 percent, and 20 percent of workers earning exactly, less than, and slightly above the minimum wage are Hispanic. Since Hispanics comprise only 14 percent of workers during our sample period, Hispanics are much more likely to be employed at low wages than other racial and ethnic groups. The majority of these low-wage Latino workers are foreign-born, although about one-third of low-wage Latino workers are U.S.-born. Table 1 also indicates that women and individuals who have not completed high school are disproportionately employed in low-wage jobs.[10]

We examine four groups of teenagers and low-education adults: Latino immigrants, Latino natives, non-Hispanic whites, and non-Hispanic blacks. All individuals who identify themselves as being of Hispanic origin or descent are considered

[9] The table, like all of the earnings analyses presented here, is based only on workers paid an hourly wage. The results are qualitatively similar if workers paid at other frequencies are included, although the workers then tend to be older and have more education. Unlike the other tables shown here, Table 1 includes all Latinos, regardless of place of birth. The samples we use later on restrict native-born Latinos to Hispanics born in the U.S. (and not in outlying areas such a Puerto Rico) and foreign-born Latinos to Hispanics born in Latin America, Cuba, or the Dominican Republic.

[10] The share of workers who lack a high school degree or its equivalent is overstated in the table as some people may yet go on to complete such a degree in the future.

Hispanic (Latino) in this analysis. Latino immigrants are Hispanic individuals who were born in Latin America (Mexico, Central America, and South America), Cuba, or the Dominican Republic and were not U.S. citizens at birth. Latino natives are Hispanic individuals who report being born in the U.S. (not in an outlying area such as Puerto Rico) and who were U.S. citizens at birth.[11] In this analysis, non-Hispanic whites and blacks are individuals who identified themselves as white or black but did not identify themselves as Hispanic. Hispanic individuals therefore can be of any race. Our samples do not include other non-Hispanic individuals, such as Asians, because sample sizes are relatively small for such groups. Non-Hispanic whites and blacks are not divided into immigrants and natives because very few (less than 2 percent) are immigrants.[12]

We analyze two labor market outcomes: average hourly earnings and employment. Individuals who are employed during the survey week report how much they earn per hour, week, or other time period. Our earnings analysis focuses on individuals who are paid hourly in order to reduce measurement error.[13] The earnings analysis also only includes individuals who earn at least $1 per hour and at most $100 per hour, again in order to reduce measurement error.[14] Earnings and the minimum wage are corrected for inflation with the monthly consumer price index for urban wage earners (CPI-W).

Table 2 reports descriptive statistics for our samples. Real average hourly earnings and employment are both considerably lower among teenagers than among

[11] People born in outlying areas (e.g., Puerto Rico and Guam) are U.S. citizens at birth. These people are not included in the sample used here.
[12] The small shares of immigrants among non-Hispanic whites and blacks are due to the fact that our sample is limited to adults who lack a high school degree and teens.
[13] For a discussion of measurement error in earnings variables in the CPS, see Lemieux (2006).
[14] This restriction drops 0.04 percent of the teenage sample and 0.07 percent of the low-education adult sample.

adults who do not have a high school diploma. Reflecting the fact that most immigrants arrive as young adults and not as children, only 4 percent of the teenage sample is foreign-born Latino compared with 33 percent of the low-education adult sample. The proportions composed of native-born Latinos and non-Hispanic blacks are similar for the two samples at about 10 and 15 percent, respectively.

As suggested by the age and education characteristics of low-wage workers, a large fraction of teenagers and low-education adults earn near the minimum wage. Figures 3 to 6 show the distribution of hourly earnings relative to the minimum wage among teenagers and low-education adults in our samples. Figures 3 and 5 show the fraction of workers in each race/ethnicity group earning various percentiles of the minimum wage (measured in 25 percent increments), and Figures 4 and 6 show the cumulative density function (the cumulative fraction of workers earning various percentiles of the minimum wage) for each group.

The distributions indicate several interesting patterns. A large proportion of teens earn about 125 percent of the minimum wage, as indicated by the spike in the earnings distribution in Figure 3. Very few teens earn more than 200 percent of the minimum wage, as shown in Figure 4. Overall, given how close together the lines are on Figures 3 and 4, the data suggest few differences in the distribution of hourly earnings by race/ethnicity/nativity among teens.

Among low-education adults, in contrast, more differences are apparent across these groups (Figures 5 and 6). Latino immigrants and non-Hispanic blacks have the lowest earnings, followed by Latino natives. The earnings distribution is less centered on

the minimum wage among low-education adults than among teenagers, suggesting that the minimum wage plays a larger role in teens' labor market outcomes.

Methods

We estimate two main regression models, one for hourly earnings and one for employment. The explanatory variable of interest in both models is the minimum wage. We expect to see a positive relationship between the minimum wage and hourly earnings, and a negative relationship between the minimum wage and employment. Our regression model for earnings, estimated using Ordinary Least Squares (OLS), is:

$$\ln \text{Wage}_{ist} = \alpha + \beta_1 \ln \text{MW}_{st} + \beta_2 \text{Demographics}_i + \beta_3 \text{Business Cycle}_{st} + \beta_4 S_s + \beta_5 T_t + \varepsilon_{ist}, \quad (1)$$

where *i* indexes individuals, *s* indexes states, and *t* indexes time periods (survey month and year) in individual-level data. The dependent variable, $ln\ Wage_{ist}$, is the natural log of real hourly earnings for individual *i*, who lives in state *s* and is surveyed at time *t*. Again, only workers who are paid hourly are included in the earnings samples. Because the wage variables are measured in logs, the coefficient on the real minimum wage variable, β_1, gives the elasticity of average hourly earnings with respect to the minimum wage (the percentage change in wages if the minimum wage increases by 1 percent).

The regressions include several other variables besides the minimum wage. Variables measuring individuals' age and its square and an indicator variable for females are included to control for demographic characteristics that might be related to earnings. For example, females are more likely to work as wait staff, a job that often pays less than

the minimum wage because of tips. We include several controls for state economic conditions (the business cycle): the natural log of real personal income per capita, the real contract value of residential building permits, the number of initial unemployment claims, and the state unemployment rate in that month and year.[15] The regressions include state fixed effects to control for any time-invariant factors that affect average wages within a state and time fixed effects to control for any time factors that are common across states, such as the national business cycle.

We pool the data for the various race/ethnicity/nativity groups and interact the minimum wage variable with an indicator variable for each group. We estimate separate regressions for teenagers and low-education adults since the coefficients may differ considerably across these groups. The standard errors are clustered on group, state, and time period to control for heteroscedasticity.

The regression model for employment is similar to the earnings model except that we use a probit model because the dependent variable, $Work_{ist}$, is a dichotomous variable that equals 1 if an individual is employed and 0 otherwise:

$$\text{Work}_{ist} = \Phi(\alpha + \beta_1 \ln \text{MW}_{st} + \beta_2 \text{Demographics}_i + \beta_3 \text{Business Cycle}_{st} + \beta_4 S_s + \beta_5 T_t + \varepsilon_{ist}), \quad (2)$$

where Φ is the standard cumulative normal distribution. For ease of interpretation, we report the derivatives of the estimated probit coefficients for the minimum wage variable

[15] The personal income data are deflated using the personal consumption expenditures index. Both are published quarterly by the Bureau of Economic Analysis. Real personal income is linearly interpolated throughout quarters. The population data are data for July of each year from the Bureau of the Census and are linearly interpolated. The initial claims and permits data are from BLS and Census, respectively, and are seasonally adjusted. The unemployment rate data are published monthly by the Bureau of Labor Statistics and are seasonally adjusted.

(which is again interacted with indicator variables for the various race/ethnicity/nativity groups). These derivatives (changes in probability) are evaluated at the sample means for continuous variables. The reported results therefore can be interpreted like results from an OLS regression; they indicate the percentage point change in the probability of employment if the minimum wage increases by 1 percent. The employment regressions also include variables measuring age and its square, sex, business cycle controls, and state and survey month/year fixed effects. Observations are clustered on group, state, and survey month/year.

Results

The minimum wage has a major effect on earnings among teenagers and, to a lesser extent, among low-education adults. Table 3 shows the results from the earnings regressions, with teenagers in column 1 and adults in column 3. Among teenagers, average hourly earnings increase by about 1.9 percent when the minimum wage increases by 10 percent (column 1). The estimated elasticities are similar in magnitude for all four race/ethnicity/nativity groups of teenagers.[16] The results for low-education adults are smaller than those for teens and differ across groups. A 10 percent increase in the minimum wage raises average hourly earnings by about 0.4 percent among foreign-born Latino adults who do not have a high school diploma, 1 percent among native-born Latinos, 1.3 percent among non-Hispanic whites, and 0.6 percent among non-Hispanic blacks (column 3).

Applying the basic competitive model to the earnings results suggests that minimum wages will have a more adverse employment effect among teens than among

[16] Only the estimated elasticities for white and black teenagers are statistically significantly different from each other. Nonetheless, the difference is small in economic terms.

low-education adults and a more adverse effect among non-Hispanic white adults than among blacks or Latinos, particularly foreign-born Latinos. These predictions are only partially borne out in the employment results, which are also shown in Table 3. Column 2 reports the employment regression results for teenagers and column 4 for adults.

For both teens and low-education adults, the adverse employment effects of higher minimum wages appear to be greatest among non-Hispanic blacks. Among teenagers, the estimates indicate that a 10 percent increase in the minimum wage lowers the probability of employment by about 0.7 percentage points for foreign-born Latinos, 0.9 percentage points for native-born Latinos, and 1.4 percentage points for non-Hispanic blacks (column 2). There is no significant disemployment effect among non-Hispanic white teens. For low-education adults, higher minimum wages are not significantly adversely associated with employment among any of the groups examined here. The minimum wage is actually *positively* associated with employment among both foreign- and native-born Latinos and non-Hispanic whites. This positive impact is largest among foreign-born Latino adults, with a 10 percent increase in the minimum wage boosting the probability of employment by about 1 percentage point (column 4).

Taken together, the results suggest that higher minimum wages boost earnings among both teenagers and low-education adults and have adverse employment effects among most groups of teenagers. Our failure to find a negative employment effect among white teenagers and among adults appears, at face value, to contradict the predictions of the simple supply and demand model presented above. The model predicts that if minimum wages are positively associated with earnings, then minimum wages should be negatively associated with employment. We next investigate two potential reasons for

these rather anomalous results: substitution across skill groups and sub-minimum wages among undocumented immigrants.

A. Substitution across Skill Groups

Substitution across workers with different skill levels could help reconcile our results with the competitive model. Employers might replace the least-skilled workers with more skilled workers when the minimum wage increases. If higher minimum wages induce an increase in the quantity of labor supplied, as the simple model suggests would happen, then employers should be able to choose among workers and hire the more skilled ones. The results in Table 3 suggest that employers substitute adult workers – particularly foreign-born Latinos – for teenage workers when the minimum wage increases.

To further investigate this possibility, we examine the inter-relationship between minimum wages and age and education, which are proxies for skill.[17] If firms substitute more skilled workers for less skilled workers as the minimum wage increases, workers who are older and have more education should face less adverse employment effects than younger and less-educated workers. Wages among more-skilled workers also may be less tied to the minimum wage than among less-skilled workers, for whom the minimum wage may act as a binding floor. We estimated the following basic probit model to

[17] Another way to examine substitution across workers is to look for differences across groups in transitions into and out of employment using panel data. This approach would involve matching individual records across two consecutive years in the CPS. The CPS is a survey of housing units (residences), not household or individuals. It does not track individuals or households over time, so movers disappear from the sample. We do not pursue this approach because young adults and immigrants tend to have relatively high mobility rates and therefore are not likely to reappear in the CPS.

examine whether the employment effect of the minimum wage differs by age and education:

$$\text{Work}_{ist} = \Phi(\alpha + \beta_1 \ln \text{MW}_{st} + \beta_2 \ln \text{MW}_{st} * \text{Age}_i + \beta_3 \ln \text{MW}_{st} * \text{No high school}_i + \beta_4 \text{Demographics}_i + \beta_5 \text{Business Cycle}_{st} + \beta_6 S_s + \beta_7 T_t + \varepsilon_{ist}), \quad (3)$$

where the dependent variable is a dummy variable indicating whether an individual is employed. In the regressions for teenagers, the minimum wage variable is interacted with dummy variables for each of the four possible ages (16, 17, 18, and 19).[18] In the regression for low-education adults, the minimum wage is interacted with a linear age variable. The minimum wage variable is also interacted with a dummy variable that equals 1 if an individual has at most 8 years of education. These interactions allow us to examine how the effect of the minimum wage varies by age and education, our proxies for skill. All of these interactions are further interacted with dummy variables for the four race/ethnicity/nativity groups to allow us to examine how the effects differ across these groups.

The regressions also include demographic controls for age and sex, a dummy variable for having at most 8 years of education, controls for the business cycle, and state and month/year fixed effects. As in all regressions here, observations are weighted using the CPS outgoing rotation group weights and the standard errors are clustered on race/ethnic group, state, and survey date. We report derivatives of the probit coefficients in Table 4. These results indicate the percentage point change in the probability of

[18] Because the minimum wage variable is interacted with dummy variables for all four age groups for teens, those regressions do not include a "main effect" variable for the minimum wage. In other words, $\beta_1 = 0$ in the regressions for teenagers.

employment if the minimum wage increases by 1 percent. The top panel shows results for teens, and the bottom panel for adults who do not have a high school diploma.

The results suggest there is skill substitution among teens in response to a higher minimum wage. Among teenagers, the adverse employment effect of the minimum wage decreases monotonically with age for all four groups. In other words, increases in the minimum wage have larger disemployment effects among younger teens, particularly those who are age 16, than among older teens. The education interaction terms for teens similarly indicate that a higher minimum wage typically lowers employment among teens who have at most an 8th grade education compared with those who have at least some high school (or more) education. Interestingly, the education result does not hold for foreign-born Latino teens (row 5, column 1), who have the lowest average levels of education among teenagers.

Some of the results for adults also suggest skill substitution. First, the "main effect" of higher minimum wages is to boost employment among low-education white adults and reduce employment among low-education black adults (row 6). Looking at the interaction terms for the minimum wage and age among adults who have not completed high school, we generally do not find that the employment effect of the minimum wage differs by age (row 7). Only among blacks does the effect of the minimum wage depend on age, with older low-education blacks experiencing relative employment gains when the minimum wage rises. That effect is consistent with skill substitution if older workers are more skilled than younger workers.

The education interaction terms for low-education adults are generally consistent with skill substitution. The results indicate that any disemployment effect of higher

minimum wages is larger (more negative) among adults who have not gone to high school than among high school dropouts for native-born Latinos, whites, and blacks.

The employment effect does not differ by education among foreign-born Latinos, however (row 8, column 1). This suggests that education may be less of a signal of skill among Latino immigrants than among other groups. This result is also consistent with the results for foreign-born Latino workers in Table 3: minimum wages have a smaller positive effect on earnings among foreign-born Latino workers than among other low-education adults, and higher minimum wages appear to boost employment among foreign-born Latinos. This occurs despite the fact that foreign-born Latinos have considerably less education, on average, than the other workers in our sample. This suggests that, among the pool of low-education workers, immigrants may be the most productive workers. A positive selection process on unobservable characteristics, such as motivation and willingness to work hard, may underlie this finding, although other factors, such as undocumented status, may also play a role.

B. Legal Status and Years of U.S. Residence

Our main results indicate that the positive relationship between the minimum wage and average hourly earnings is smaller among adult Latino immigrants than among other workers and that higher minimum wages are associated with an *increase* in employment among adult Latino immigrants. Employers may substitute adult Latino immigrants for other workers when the minimum wage rises if adult Latino immigrants are perceived as more productive than other low-skilled workers. Another possibility is that many adult Latino immigrants are paid less than the legal minimum wage because

they are undocumented immigrants, causing increases in the minimum wage to have less effect among this group and causing employers to substitute toward them when the minimum wage increases. Indeed, in our sample of adult low-education hourly-paid workers, 4.8 percent of immigrant workers report earning less than the legal minimum, compared with 3.8 percent of native-born workers.[19]

Theoretically, the effect of minimum wages could be smaller or larger among undocumented immigrants than among those who are legally present in the U.S.[20] Employers may be more likely to pay undocumented workers less than the legal minimum, particularly if they are aware that the workers lack legal status and therefore are unlikely to complain to authorities for fear of being deported. An employer who is already breaking the law in knowingly hiring undocumented workers may also disregard minimum wage laws. If so, then undocumented workers are less likely to be affected by changes in minimum wage laws than legal immigrants.

However, undocumented workers tend to be less skilled than legal immigrants. They have less education, are younger, and have fewer years of U.S. experience, on average (Jasso et al. 2004; Passel et al. 2006). Hence undocumented workers may be more likely to earn low wages than legal immigrants and therefore be more affected by changes in minimum wages. On the other hand, despite lower education levels, it could be that illegal immigrants work harder under tougher conditions, making them more productive in spite of their low education levels. On a theoretical level, it is simply not

[19] The literature on immigrant-native differentials in non-compliance with minimum wage laws generally finds no significant difference between immigrants and natives in the fraction earning less than the federal minimum wage (Cortes 2004; Fry and Lowell 1997; Trejo 1998).

[20] Winegarden and Khor (1991) make a similar argument in modeling the effect of undocumented immigration on unemployment rates among U.S.-born youth and minority workers when wages are sticky.

clear whether undocumented immigrants are more or less affected by minimum wage laws than other workers.

Undocumented immigrants appear to compose a large and growing fraction of the low-wage foreign-born labor force. Estimates suggest that up to one-half of all low-skilled immigrant workers – or about 3.1 million people – were undocumented in 2005 (Capps, Fortuny, and Fix 2007). Many of these undocumented workers are Latinos, as Latin American countries accounted for at least 80 percent of undocumented immigrants present in the U.S. in 2000 (INS 2003; Passel, Capps, and Fix 2004).

The CPS does not ask about visa type or other direct indicators of legal status. However, years of U.S. residence, country of origin, and U.S. citizenship – variables that are included in the CPS – should be associated with whether an immigrant is undocumented.[21] Most undocumented immigrants have been present in the U.S. for less time than legal immigrants, and the majority of undocumented immigrants are from Mexico.[22] We therefore investigate whether years of U.S. residence, being from Mexico, and being a naturalized U.S. citizen influence the impact of minimum wages on earnings and employment among immigrants from Latin America.[23]

[21] The CPS reports year of entry in intervals, and we used the midpoint of those intervals to calculate the numbers of years of U.S. residence. Our approach obviously assumes that the CPS includes some undocumented immigrants. Bean et al. (1998) and Hanson (2006) both explicitly state that the CPS includes undocumented immigrants. Previous studies have used the CPS to examine undocumented immigrants (e.g., Kaushal 2006; Massey and Bartley 2005; Passel 2004, 2005a, 2005b; Passel et al. 2004).

[22] In 2004, over half of Mexican immigrants present in the U.S. were undocumented, including at least 80 percent of those who entered during the 1990s and early 2000s (Passel 2004, 2005a). Because of the 1997 Nicaraguan Adjustment and Central American Relief Act (NACARA) as well as greater distance from the U.S. border, immigrants from other Latin American countries are more likely than Mexicans to be legally present in the U.S. See Kaushal (2006) for a discussion of the effect of NACARA on earnings and employment.

[23] We caution that the quality of self-reported variables on immigration status is an issue in this type of exercise. While it seems unlikely that undocumented immigrants would report being naturalized U.S. citizens, misreporting of citizenship status is a well-known problem in the literature that relies on CPS and decennial Census data (Passel 2007; Passel and Clark 1998).

Within the sample of Latin American immigrants, we interacted the minimum wage variable with a linear variable measuring years of U.S. residence and with dummy variables indicating whether an immigrant was from Mexico and whether an immigrant reported being a naturalized U.S. citizen. We estimated the following regression model:

$$\text{Labor Market Outcome}_{ist} = \alpha + \beta_1 \ln MW_{st} + \beta_2 \ln MW_{st}*\text{Years in U.S.}_i + \beta_3 \ln MW_{st}*\text{Mexico}_i + \beta_4 \ln MW_{st}*\text{ naturalized U.S. citizen}_i + \beta_5 \text{Demographics}_i + \beta_6 \text{Business Cycle}_{st} + \beta_7 S_s + \beta_8 T_t + \varepsilon_{ist}, \quad (4)$$

where the dependent variable is the natural log of hourly earnings (and the regression is estimated using OLS) or a dummy variable that equals 1 if an individual is employed (and a probit model is estimated). The set of demographic controls includes the number of years that an individual has lived in the U.S., the Mexico and naturalized U.S. citizen dummy variables (the "main effects"), as well as age, age squared, and sex. As before, we report estimated OLS coefficients for the earnings regressions and marginal probit coefficients for the employment regressions.

If undocumented immigrants tend to have fewer years of U.S. residence and minimum wage laws affect undocumented immigrants less because employers pay them less than the minimum wage, then we expect to find that the impact of the minimum wage on earnings and employment grows with years of U.S. residence. A similar result should hold for U.S. citizenship – individuals who report being U.S. citizens should be more affected by minimum wage laws if employers violate these laws when paying undocumented immigrants. If immigrants from Mexico are more likely to be

undocumented and undocumented workers are paid less than the minimum wage, then the minimum wage should have less of an impact on earnings and employment among Mexicans.

Table 5 shows the results. Few of the estimated coefficients are significant for teenagers. This is not surprising since the teenage samples are relatively small because most immigrants come as adults. The results for teens indicate that years of U.S. residence is negatively associated with earnings for foreign-born teens—a surprising result—and that higher minimum wages boost wages more among teens the longer they have lived in the U.S.

In the adult low-education sample, both earnings and employment increase with years of U.S. residence (row 2) and are lower among naturalized U.S. citizens (row 4). Immigrants from Mexico are more likely to be working than other Latino immigrants (row 3, column 4). Any adverse impact of higher minimum wages on employment increases with years of U.S. residence, which is consistent with the hypothesis that legal immigrants are more affected by minimum wage increases than the undocumented (row 5, column 4). The positive wage effect of higher minimum wages is also larger among naturalized U.S. citizens (row 7, column 3). Any adverse employment effect is larger among immigrants from Mexico, who are more likely to be undocumented (row 6, column 4). In addition, the employment effect of higher minimum wages is positive (or less negative) among naturalized U.S. citizens (row 7, column 4).

These results provide mixed support for our hypothesis that undocumented immigrants are less likely to be affected by changes in the minimum wage, which could account for the somewhat anomalous results for Latin American immigrants. We caution

that we are not able to identify which immigrants in the CPS data are undocumented and use only crude indicators of undocumented status. Other researchers have noted, for example, that the citizenship variable overstates naturalization among recent immigrants – many of whom are likely undocumented (Passel 2007). Correcting the citizenship variable and combining CPS data with better data on undocumented immigrants, such as data from the Mexican Migration Project and the Latin American Migration Project, might shed more light on non-compliance and the effect of minimum wages among undocumented immigrants.

Conclusion

This chapter examined whether the impact of minimum wages differs between foreign- and native-born Latinos and their non-Hispanic counterparts in the U.S. Data from 1994-2007 indicate that higher minimum wages are associated with an increase in teens' hourly earnings that is similar across race/ethnicity/nativity groups. However, the disemployment effect is smaller among foreign-born Latino teenagers than among their black and native-born Latino counterparts and non-existent among white teens. This, combined with other results here, suggests substitution across skill groups as the minimum wage increases. Among adults who do not have a high school diploma (or equivalent), our results indicate that the wage-boosting effect of higher minimum wages is smallest among foreign-born Latinos. Employment among low-education adult Latino foreign- and native-born workers (and among whites) is positively associated with the minimum wage. Our results suggest more non-compliance with minimum wage laws among low-education Latino immigrants, many of whom are undocumented, but these findings are not conclusive. Even though minimum wage laws apply equally to citizens,

legal immigrants, and the undocumented, workers who lack legal status might not know about their worker rights or might be reluctant to confront employers for fear of reprisal.

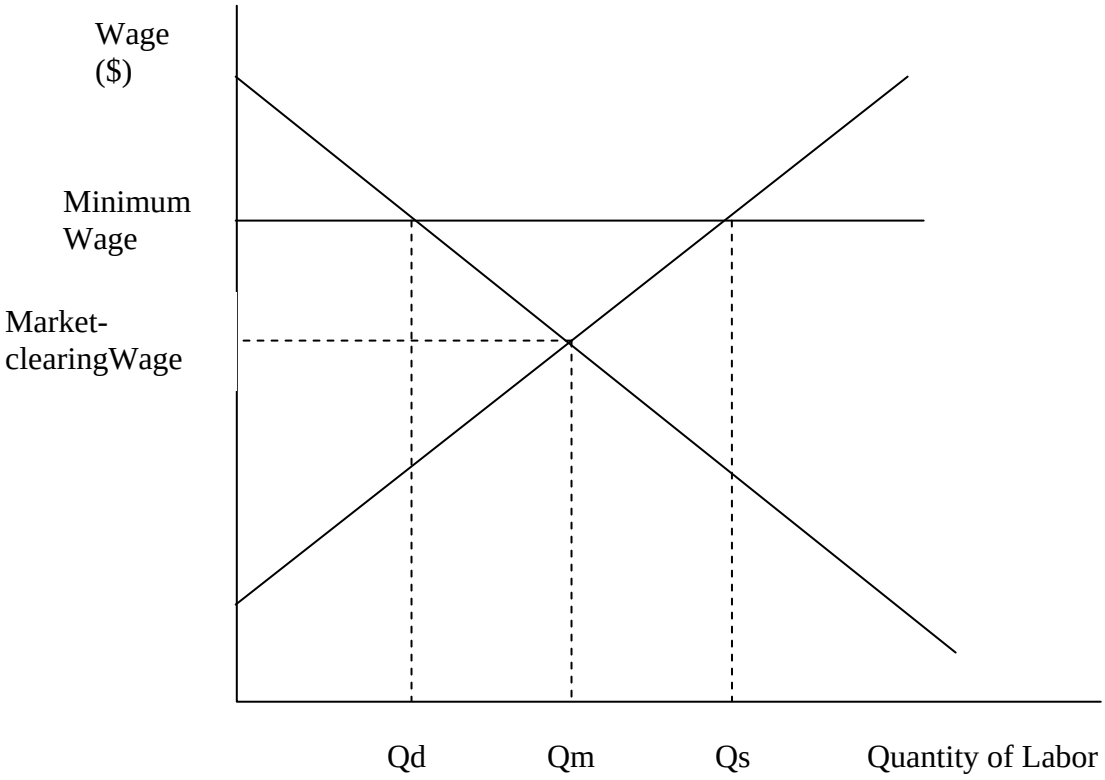

Figure 1. A simple model of the expected effects of imposing a minimum wage.

Figure 2. Real Value of Federal Minimum Wage, 1994-2007

Figure 3. Distribution of Hourly Earnings Relative to Minimum Wage among Teenagers

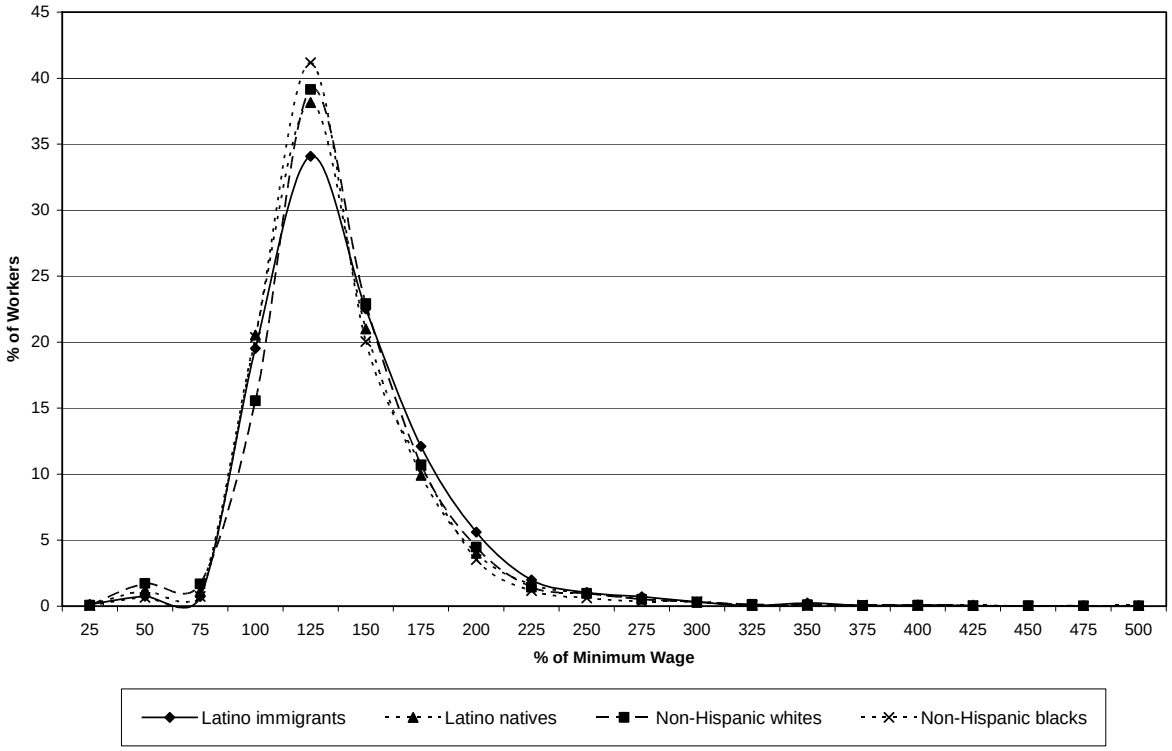

Figure 4. Cumulative Distribution of Hourly Earnings Relative to Minimum Wage among Teenagers

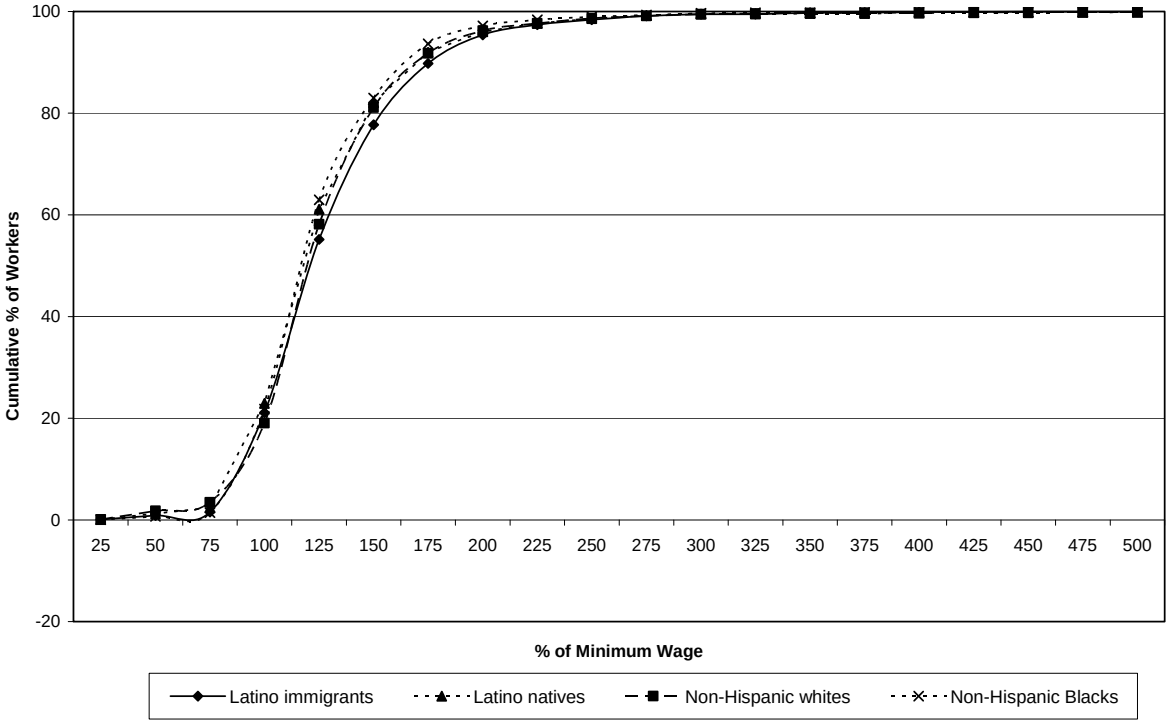

Figure 5. Distribution of Hourly Earnings Relative to Minimum Wage among Low-Education Adults

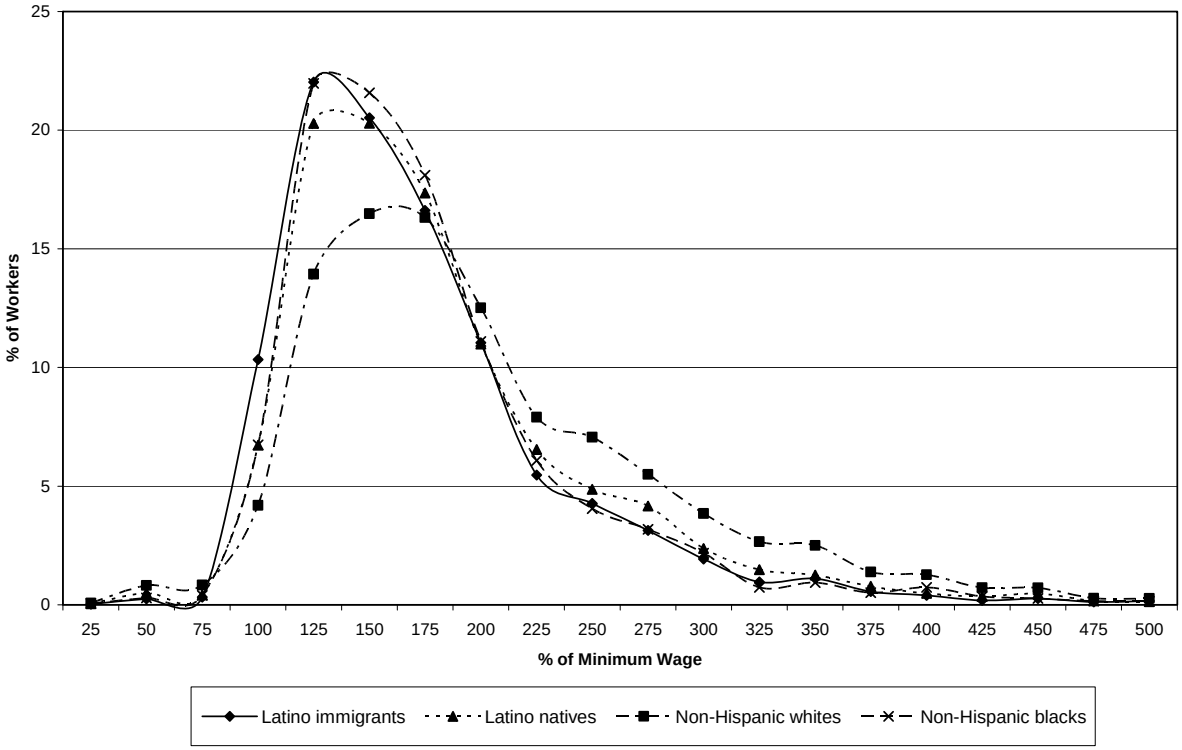

Figure 6. Cumulative Distribution of Hourly Earnings Relative to Minimum Wage among Low-Education Adults

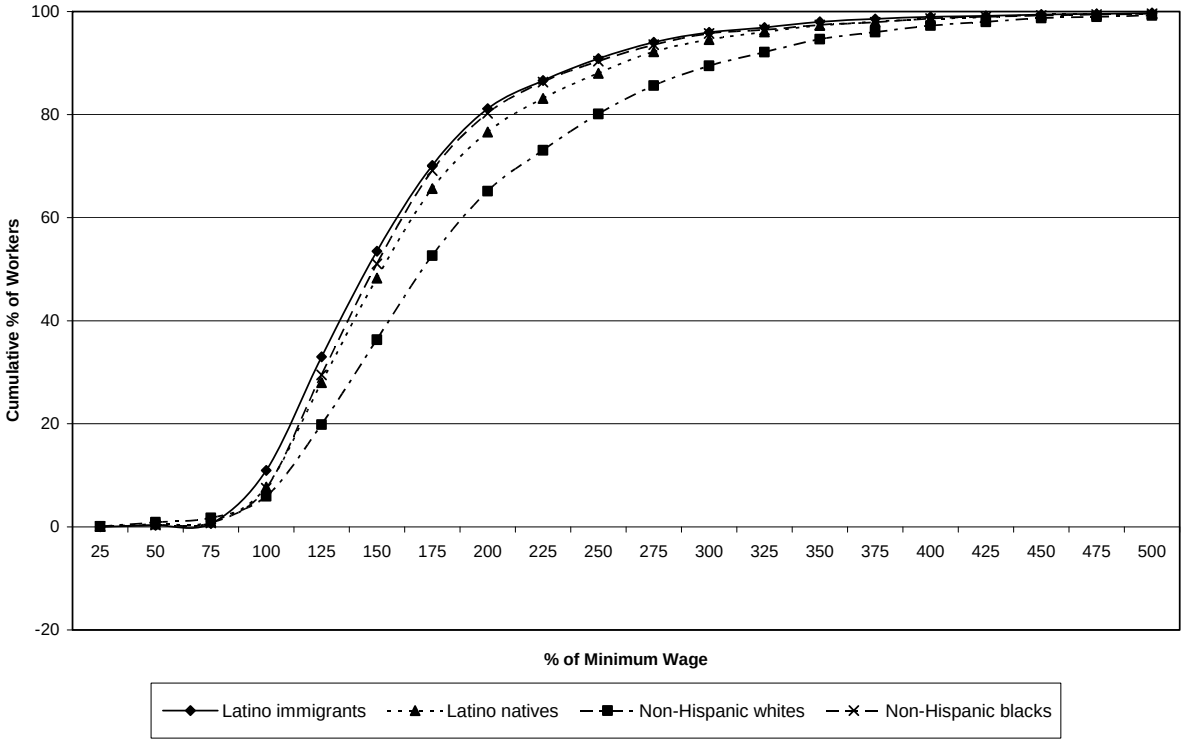

Table 1. Characteristics of Low-Wage Hourly Workers

	Workers Paid Hourly Earning:			
	Exactly MW	Below MW	Within 125% of MW	All Workers Paid Hourly
Average age	29.2	30.2	31.0	37.2
	(14.3)	(14.4)	(14.7)	(13.5)
Teen (ages 16-19)	0.33	0.26	0.27	0.08
	(0.47)	(0.44)	(0.44)	(0.27)
Young adult (ages 20-24)	0.21	0.24	0.22	0.14
	(0.41)	(0.43)	(0.41)	(0.35)
Latino	0.27	0.16	0.20	0.14
	(0.45)	(0.37)	(0.40)	(0.35)
Native-born Latino	0.09	0.06	0.08	0.06
	(0.29)	(0.25)	(0.27)	(0.25)
Foreign-born Latino	0.18	0.10	0.12	0.08
	(0.38)	(0.30)	(0.33)	(0.27)
White (non-Hispanic)	0.55	0.67	0.61	0.68
	(0.50)	(0.47)	(0.49)	(0.47)
Black (non-Hispanic)	0.12	0.11	0.14	0.13
	(0.33)	(0.31)	(0.35)	(0.33)
Female	0.59	0.64	0.59	0.50
	(0.49)	(0.48)	(0.49)	(0.50)
Less than high school graduate	0.46	0.34	0.37	0.17
	(0.50)	(0.48)	(0.48)	(0.38)
Sample size	29,441	47,795	165,491	1,440,822

Note: Shown are means (standard deviations) based on individual-level data from the CPS-ORG during the period 1994-2007 for workers who report being paid hourly, weighted using the outgoing rotation weights. Workers who earn less than $1 per hour or more than $100 per hour are not included. Latinos are all individuals who identify themselves as Hispanic. Native-born Latinos are Hispanics born in the U.S. or outlying areas, and foreign-born Latinos are Hispanics born outside of the U.S. and outlying areas.

Table 2. Descriptive Statistics for Samples of Teenagers and Low-Education Adults

	Teenagers	Adults
Real hourly earnings	7.63	10.59
(conditional on employment)	(2.89)	(4.99)
Employed	0.42	0.61
	(0.49)	(0.49)
Average age	17.5	36.1
	(1.1)	(10.0)
Foreign-born Latino	0.04	0.33
	(0.20)	(0.47)
Native-born Latino	0.11	0.09
	(0.32)	(0.29)
White (non-Hispanic)	0.69	0.44
	(0.46)	(0.50)
Black (non-Hispanic)	0.16	0.15
	(0.36)	(0.35)
Female	0.49	0.47
	(0.50)	(0.50)
Sample size, all	278,351	259,296
Sample size, hourly workers	110,199	116,601

Note: Shown are means (standard deviations) based on weighted individual-level data from the CPS-ORG during the period 1994-2007. Low-education adults do not have a high school diploma and are ages 20-54. The sample for average hourly earnings only includes workers who report being paid hourly and earn at least $1 per hour and no more than $100 per hour. Earnings are deflated using the CPI-W (January 2007 = 100). Latinos are individuals who identify themselves as Hispanic. Native-born Latinos are only Hispanics born in the U.S. (not outlying areas), and foreign-born Latinos are Hispanics born in Latin America, Cuba, or the Dominican Republic.

Table 3. Effect of the Minimum Wage on Average Hourly Earnings and Employment

	Teens		Low-Education Adults	
	Earnings	Employment	Earnings	Employment
Foreign-born Latino	0.195**	-0.065**	0.041†	0.101**
	(0.018)	(0.022)	(0.025)	(0.022)
Native-born Latino	0.191**	-0.085**	0.096**	0.044*
	(0.018)	(0.021)	(0.025)	(0.022)
White (non-Hispanic)	0.195**	-0.012	0.126**	0.048*
	(0.018)	(0.021)	(0.025)	(0.022)
Black (non-Hispanic)	0.187**	-0.144**	0.064*	-0.029
	(0.018)	(0.021)	(0.025)	(0.022)

† p<.1; * p<.05; ** p<.01

Note: "Earnings" columns report estimated coefficients on the natural log of the real minimum wage from OLS regressions in which the dependent variable is the natural log of the real hourly earnings. "Employment" columns report derivatives of estimated coefficients on the natural log of the real minimum wage from probit regressions in which the dependent variable equals 1 if an individual is employed and 0 otherwise. All regressions include age, age^2, sex, business cycle controls, and state and survey month/year fixed effects. Less-educated adults are ages 20-54 and do not have a high school diploma; teens are ages 16-19. Robust, clustered standard errors are in parentheses. Observations are weighted using the outgoing rotation weights.

Table 4. Effects of the Minimum Wage on Employment by Age and Education

	Foreign-born Latino	Native-born Latino	White	Black
	(1)	(2)	(3)	(4)
Teens:				
Minimum wage * age 16	-0.144*	-0.125**	-0.120**	-0.134**
	(0.067)	(0.045)	(0.031)	(0.049)
Minimum wage * age 17	-0.064	-0.061	-0.058*	-0.093*
	(0.066)	(0.044)	(0.029)	(0.047)
Minimum wage * age 18	0.058	0.037	0.001	-0.022
	(0.064)	(0.045)	(0.030)	(0.047)
Minimum wage * age 19	0.085	0.082†	0.020	0.005
	(0.064)	(0.046)	(0.032)	(0.048)
Minimum wage * no high school	-0.083	-0.255**	-0.282**	-0.301**
	(0.078)	(0.079)	(0.078)	(0.079)
Low-Education Adults:				
Minimum wage	0.075	0.021	0.112*	-0.160*
	(0.052)	(0.059)	(0.053)	(0.065)
Minimum wage * age	0.001	0.001	0.001	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)
Minimum wage * no high school	-0.040	-0.074*	-0.118**	-0.152**
	(0.029)	(0.029)	(0.029)	(0.030)

† p<.1; * p<.05; ** p<.01

Note: Shown are estimated derivatives of coefficients on the natural log of the real minimum wage from probit regressions; the dependent variable equals 1 if an individual is employed and 0 otherwise. All regressions include age and age^2 (dummy variables for age 16, age 17, and age 18 in the teenage regressions), sex, a dummy variable for no high school (8 years of education or less), business cycle controls, and state and survey month/year fixed effects. Separate regressions were estimated for teens and low-education adults. Less-educated adults are ages 20-54 and do not have a high school diploma; teens are ages 16-19. Robust, clustered standard errors are in parentheses. Observations are weighted using the outgoing rotation weights.

Table 5. Effect of the Minimum Wage among Latin American Immigrants

	Teens		Low-Education Adults	
	Earnings	Employment	Earnings	Employment
	(1)	(2)	(3)	(4)
Minimum wage	0.120	-0.002	0.091	0.081
	(0.155)	(0.161)	(0.058)	(0.068)
Years of U.S. residence	-0.037†	-0.010	0.009*	0.007†
	(0.019)	(0.019)	(0.004)	(0.004)
From Mexico	0.089	0.316	-0.058	0.206*
	(0.247)	(0.196)	(0.076)	(0.093)
Naturalized U.S. citizen	0.105	-0.248	-0.306**	-0.379**
	(0.363)	(0.241)	(0.100)	(0.108)
Minimum wage * years of U.S. residence	0.021†	0.002	-0.001	-0.004†
	(0.011)	(0.011)	(0.002)	(0.002)
Minimum wage * from Mexico	-0.054	-0.134	0.017	-0.134**
	(0.142)	(0.143)	(0.043)	(0.047)
Minimum wage * naturalized U.S. citizen	-0.041	0.195	0.216**	0.220**
	(0.203)	(0.219)	(0.056)	(0.054)

† p<.1; * p<.05; ** p<.01

Note: The sample includes only immigrants from Latin America, Cuba, and the Dominican Republic. Columns 1 and 3 show estimated coefficients on the natural log of the real minimum wage from OLS regressions; the dependent variable is the natural log of the real hourly earnings. Columns 2 and 4 show estimated derivatives of coefficients on the natural log of the real minimum wage from probit regressions; the dependent variable equals 1 if an individual is employed and 0 otherwise. All regressions include age, age^2, sex, U.S. citizenship status, state and survey month/year fixed effects, and business cycle controls. Less-educated adults are ages 20-54 and do not have a high school diploma; teens are ages 16-19. Robust, clustered standard errors are in parentheses. Observations are weighted using the outgoing rotation weights.

Appendix Table 1. States that Exceeded the Federal Minimum Wage

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Alaska	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Arizona														X
Arkansas													X	X
California				X	X	X	X	X	X	X	X	X	X	X
Colorado														X
Connecticut	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Delaware			X	X		X	X	X	X	X	X	X	X	X
D.C.	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Florida													X	X
Hawaii	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Illinois											X	X	X	X
Iowa	X	X	X											X
Kentucky														X
Maine									X	X	X	X	X	X
Maryland													X	X
Massachusetts			X	X	X	X	X	X	X	X	X	X	X	X
Michigan													X	X
Minnesota												X	X	X
Missouri														X
Montana														X
Nevada														X
New Hampshire														X
New Jersey	X	X	X	X								X	X	X
New York												X	X	X
North Carolina														X
Ohio														X
Oregon	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Appendix Table 1, continued

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Pennsylvania														X
Rhode Island	X	X	X	X		X	X	X	X	X	X	X	X	X
Vermont		X	X	X	X	X	X	X	X	X	X	X	X	X
Washington	X	X	X	X	X	X	X	X	X	X	X	X	X	X
West Virginia													X	X
Wisconsin												X	X	X

Note to Appendix Table 1: The federal minimum wage rose from $4.25 an hour to $4.75 an hour in October 1996, to $5.15 an hour in September 1997, and to $5.85 in July 2007. Shown are states that exceeded the federal minimum wage at any time during the year(s) indicated.

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