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ABSTRACT

Wage Effects on Immigrants from an Increase in the Minimum Wage Rate: An Analysis by Immigrant Industry Concentration*

Using the monthly samples of the Current Population Survey (CPS) outgoing rotation group files, this paper analyzes the most recent increase in the U.S. minimum wage rate. This study focuses on immigrant and native-born workers who are employed in industries with low and high immigrant concentrations, and investigates whether there is any relationship between industry non-compliance and the concentration of immigrant workers. This study finds that resultant wage increases were equal for both immigrants and natives. Also, the analysis shows no existing evidence of non-compliance towards immigrant workers; but rather that female immigrants in immigrant-intensive industries (the worst off in the sample) are the workers with the highest compliance towards them.

JEL Classification: J00, J10, J82, J83

Keywords: minimum wage, immigrant workers, immigrant-intensive industries, minimum wage compliance

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1. Introduction

Minimum wage rate is increased with the hope that workers at the bottom of the wage distribution will benefit. This is true for those workers who remain or thereafter become employed, if all firms comply with the newly enacted minimum wage rate. Past research has shown that less skilled workers benefit from an increase in the minimum wage (DiNardo, Fortin, and Lemieux, 1996). We should expect immigrant workers to benefit as well, since on average they are less skilled than native workers (Borjas, 1985, 1987, 1995; Shoeni, 1997; Meisenheimer, 1992). If the wages of immigrant workers do not change after an increase in the minimum wage rate, could it be that industries with high immigrant concentration opt not to comply with minimum wage laws? If industries choose not to comply with minimum wage law changes—particularly in immigrant-intensive firms—immigrant workers will not gain initially as much as other workers at the same end of the wage distribution, such as women and minority workers.

This paper analyzes the most recent increase in the minimum wage rate in the U.S., focusing on a group of workers that should be affected most—immigrants. In addition, this paper makes the distinction between immigrants and natives who work in low and high immigrant-intensive industries; in order to ascertain whether there is any relationship between industry non-compliance and the concentration of immigrant workers.

2. Related Literature

Immigrants in the U.S. Labor Market

Several studies have documented the main differences between the labor market characteristics of immigrants and native-born workers in the U.S. The key findings of this literature are that immigrants tend to be less educated, less skilled, and have lower level of earnings than native-born workers (Borjas, 1985, 1987, 1995; Shoeni, 1997; Meisenheimer,

1992; Trejo, 1998). But very little research has been conducted on the differences between compliance rates for immigrant and native workers. The available research on non-compliance by employers has found that immigrant workers are no less likely to be paid below the prevailing minimum wage rate than native workers (Fry and Lowell, 1997; Trejo, 1998). This study takes a new approach in that the analysis distinguishes between immigrants who work in low and high immigrant-intensive industries. This distinction is important because if there exists non-compliance to minimum wage laws among employers of immigrant workers, it would be more likely seen for immigrants employed in industries with a high concentration of immigrants.

Employment Effects of the Minimum Wage Increase from $4.25 to $5.15

While the focus of this study is to analyze wage effects of immigrant workers from this recent increase in the minimum wage, it is necessary to discuss any employment effects that this increase in the minimum wage may have had. Though there has been extensive research analyzing increases in the minimum wage rate, the overall consensus on the effect is pending (Brown, Gilroy, and Kohen, 1982; Card, 1992; Card and Krueger, 1995; Neumark and Washer, 1992, 1994; Solon, 1985; Wellington, 1991).[1] Economic theory postulates that an increase in the minimum wage rate will reduce employment; however, past work has challenged this conventional view. These studies have found negligible unemployment effects on workers after an increase in the minimum wage rate (Card, 1992a, 1992b; Card and Krueger, 1994, 1995; Katz and Krueger, 1992; Wellington, 1991).[2] However, a number of recent studies continue to show that increases in the minimum wage lead to unemployment effects of less skilled workers—in

[1] In fact, the oldest work analyzing the effects of a minimum wage hike dates back to 1915 conducted by Marie Obenauer and Bertha von der Nienburg.

[2] Card and Krueger (1995), in particular, argue that both the wages and employment of young workers can increase after a moderate increase in the minimum wage rate (See Myth and Measurement, 1995).

particular, teenage and young adult workers—groups that are generally thought to be particularly vulnerable to retrenchment (Burkhauser, Couch, and Wittenburg, 2000a, 2000b; Currie and Fallick, 1996; Deere, Murphy, and Welch, 1995; Kim and Taylor, 1995).

A study by Bernstein and Schmitt (1998) analyzing the employment effects of this recent increase finds no evidence of differential job loss among teenagers and young adults.[3] In another analysis by Burkhauser, Couch, and Wittenburg (2000a) of the same recent increase, a different empirical approach not used in the Bernstein and Schmitt (1998) study is employed. They find that even during the period of robust economic stability, this recent increase in the minimum wage rate had a statistically significant but modest negative effect on teenage employment.[4] Taken at face value, these two studies seem to indicate limited or absent employment effects. With respect to the sample of interest in this study, immigrant workers on average are less skilled compared to native-born workers in the sample, and most likely be subject to employment effects. Though employment effects are not estimated in this paper, I provide some evidence of the composition of immigrant workers before and after the enactment of this new minimum wave rate, which sheds some light on this issue.

3. Data Source, Sample Selection, and Characteristics of Immigrants and Native Workers

3.A. Data Source and Sample Selection

This study uses the monthly samples of the Current Population Survey (CPS) outgoing rotation group files from 1995 to 1998, which contain information on immigrants (including country of birth, citizenship, and years in the U.S.) since 1994. Using these data, I analyze

[3] They conduct four different tests on the employment impact of this minimum wage increase, and results show no systematic or significant job loss associated with this increase. They find that this increase in the minimum wage rate boosted the earnings of low-wage workers and benefited low-income working families.

[4] Their estimated elasticities, relative to $3.35, are -0.424, -0.339, -0.265, -0.174 at $3.80, $4.25, $4.75, and $5.15, respectively (elasticities reported from Table 8, pp. 674).

whether immigrant workers are being paid below the federal minimum wage. The monthly files of the CPS provide information on workers paid by the hour as well as weekly earnings. In addition, I also test whether compliance with minimum wage laws varies across industries based on the concentration of immigrants in that industry. Although industry compliance has been noted to be relatively difficult to monitor, available wage data show a significant amount of non-compliance with the minimum wage law. Current figures show that as many as 40 percent of the workers who qualify are paid less than the minimum wage (U.S. Bureau of the Census, *Statistical Abstract of the United States*, 1997, p. 433).

During 1995, the federal minimum wage rate stood at $4.25 per hour.[5] The new minimum wage rate of $5.15 per hour analyzed in this study was enacted on September 1, 1997. This minimum wage rate was increased in two steps: the minimum wage was first raised to $4.75 on October 1, 1996 and again to $5.15 on September 1, 1997. The analysis examines the 12 months prior to the change in the minimum wage from $4.25 (October 1995 to September 1996) and the first 12 months following the change in the minimum wage to $5.15 (September 1997 to August 1998). I focus on the larger 90 cent increase in the minimum wage to $5.15 because the 50 cent rise to $4.75 may be too small to capture an effect. Also, in order to obtain a sufficiently large sample of immigrants, I have pooled the monthly surveys of the CPS for the years 1995, 1996, 1997, and 1998.

The analysis includes workers between the ages of 16 and 64. The wage rate used in the analysis is the reported hourly wage rate for each worker in the CPS. For workers who did not report an hourly wage rate, I have assigned their average hourly earnings by taking their weekly

[5] The minimum wage became $4.25 on April 1, 1991.

earnings and dividing these by their weekly hours worked. Also, only workers with hourly wages greater than or equal to $2.00 are included in the analysis.

High immigrant-intensive industries are industries in which more than 10 percent of the workers are immigrants, and low immigrant-intensive industries are industries in which less than 10 percent are immigrants. These definitions were derived from the following calculations: First, all industries in the CPS (50 total categories) are ranked by the percentage of immigrant workers, where the highest is 45.7 percent and the lowest is 2.3 percent. Starting with the industry containing the highest percentage of immigrant workers (CPS Industry Code 10), the cumulative percentage of immigrant workers in the whole sample is then calculated. Industries contributing to the cumulative percentage up to 50 percent are classified as high immigrant-intensive. Those industries ranked lower are classified as low immigrant-intensive. The cutoff point corresponds roughly to 10 percent.[6] The overall ranking described above adequately captures the industries in which immigrants are most and least employed.[7] The objective of this industry classification is to ascertain whether compliance with minimum wage laws among employers of immigrant workers are followed. That is, if immigrants work in industries where compliance with the minimum wage rules is lax, their wages may not have been affected after the change in the minimum wage rate.

3.B. Immigrant and Native Worker Characteristics by Industry

A series of earnings distributions for the pre- and post-minimum wage regimes are estimated separately for nativity and gender in the low and high immigrant-intensive industries

[6] Table A.1 in the appendix provides the full set of information used in this ranking procedure along with the CPS industry codes.

[7] The industries which are coded as low-immigrant industries include, for example, banking and finance, health services, transportation, national security and bureau of international affairs, social services, educational services, human resource programs, and justice and public order (see Table A.1. for complete list).

using (Gaussian) kernel density estimation. These densities are shown in Figures 1 and 2 for males and females, respectively. The first vertical line in each figure marks the old minimum wage rate of $4.25 in the pre-change regime, and the second vertical line marks the new minimum wage rate of $5.15 in the post-change regime. From these estimated densities we observe that the earnings distributions of native females as well as male and female immigrants are more compressed towards the minimum wage than the earnings distributions of native males. The compression towards the minimum wage is even more pronounced for these three worker groups in the high immigrant-intensive industry sample (see Figures 1D, 2C, and 2D).

To study the effect of a change in the minimum wage on the lower end of the wage distribution, we are interested in comparing the area less than or equal to $4.25 and the area between $4.26 and $5.14 in the pre-change density. Both of these areas in the pre-change density are expected to be most affected by the change in the minimum wage. Tables 1A and 1B show the percentage of workers at different cutoffs of the earnings distributions by low and high immigrant-intensive industries in Figures 1 and 2 for both the male and female samples, respectively. The cutoff points shown in Tables 1A and 1B are at: less than $4.25, $4.25, between $4.26 and $5.14, $5.15, between $5.16 and $6.15, and greater than or equal to $6.16. These tables confirm the visual illustration conveyed by Figures 1A through 2D, that there is a scooping out from the lower tail of the pre-change distribution after the rise in the minimum wage to $5.15. There is considerably less density in the lower tail of the post-change distribution of log hourly wages for both natives and immigrants. In particular, the results presented in Table 1 show that, for immigrant workers employed in high immigrant-intensive industries, wages seemed to be affected the most by this recent increase in the minimum wage. Specifically, the percentages of male and female immigrants who earn less than $5.14 before the change in the

minimum wage are 13.57 and 19 percent, respectively; after the change in the minimum wage these percentages fall to 6.40 and 11.27 percent.

Table 2 shows the mean characteristics of the pre- and post-enactment samples and presents data by gender and nativity for the immigrant industry groups. The upper panel of the table shows that native and immigrant men in the low immigrant industries tend to have higher education and earnings than those in high immigrant industries. For the pre-enactment period, the mean log hourly wages for native and immigrant workers in the low immigrant industries are 2.54 and 2.45 log points, respectively, compared to 2.41 and 2.21 log points for native and immigrant males in high immigrant industries. Similarly, the average education levels of native and immigrant workers in low immigrant industries are 13.7 and 13.2 years, respectively, versus 12.8 and 11 years for native and immigrant males in high immigrant industries. There are also differences in number of years in the U.S. between immigrant males across the two industry groups. Average years in the U.S. for immigrant males in low immigrant industries is 16.1, compared to 13.5 years in high immigrant industries. These differentials all remain roughly constant after the rise in the minimum wage.

For the female sample, the same pattern in hourly wages, educational attainment, and number of years in the U.S. is observed. For instance, mean log hourly wages of native and immigrant females in low immigrant industries are 2.29 and 2.27, respectively, compared to 2.16 and 2.04 in high immigrant industries. Female immigrants in low immigrant industries also tend to have been in the U.S. longer than their counter parts in high immigrant industries. The data in Table 2 also shows that immigrant females in high immigrant industries tend to have the lowest wages relative to the other groups.

Also, Table 2 provides some direct evidence of the employment effects of this recent increase in the minimum wage on immigrant worker composition after the enactment of this minimum wage. Since immigrant workers have lower levels of education compared to the native-born workers (that is, taking number of years of education as a proxy for attainment), particularly in the high immigrant-intensive industries. If this minimum wage increase surpasses their marginal product, then they will be most likely to suffer employment effects. These immigrant workers might still work, but possibly outside the legitimate labor market. As a consequence, these immigrant workers may be unlikely to be included in the CPS sampling frame—that is, the lowest skilled workers are likely to be driven into the shadows (and out of the CPS) after the minimum wage increase. If this is the case, then one would expect that educational level of those in the CPS to increase just after the minimum wage increase. We observe no such compositional changes in the education levels of immigrant workers in both the low and high immigrant-intensive industries. In fact, the educational levels of immigrants before and after the enactment of minimum wage are about the same.

4. Empirical Estimation and Results

4.A Empirical Estimation

The following model specification will allow a more in depth analysis of the effects of the change in the minimum wage rate. Several model specifications of the following form are estimated using ordinary least squares estimation:

$$\ln(wage)_i = \alpha_0 + \beta_1 Post_i + \beta_2 Immigrant_i + \beta_3 High_i + \beta_4 Post_i * Immigrant_i + \beta_5 Post_i * High_i +$$

$$\beta_6 Immigrant_i * High_i + \beta_7 Post_i * Immigrant_i * High_i + X_i\psi + USYRS_i\varphi + State_i\chi + \mu_i \quad (1)$$

where $\ln(wage)_i$ is the log hourly wage rate for worker *i*; $Post_i$ is an indicator variable equal to one if the observation occurs after the enactment of the new minimum wage rate of $5.15 on September 1, 1997; $Immigrant_i$ is an indicator variable for immigrant status; and $High_i$ is an indicator variable indicating the high immigrant industry group. The model includes a full set of "two-way" interactions between immigrant status, industry group, and time, as well as a "three-way" interaction capturing the differential trend in wages for immigrants in the high immigrant industry group after the rise in the minimum wage. The vector X_i is a set of standard controls used in all models specifications (i.e., a quartic function of age, marital status, and educational attainment); $USYRS_i$ is a vector of dummy variables indicating numbers of years in the U.S. (i.e., less than five, between five and ten, between 11 and 15, between 16 and 20, and more than 21 years in the U.S.); $State_i$ is a vector of state dummies; and μ_i is an error term.

Table 3 reports the regression results for three versions of equation (1) estimated separately for males and females. Model 1 is a parsimonious specification that includes only the standard controls. Model 2 includes the standard controls plus a series of variables indicating number of years in the U.S. (i.e., less than five, between five and ten, between 11 and 15,

between 16 and 20, and more than 21 years in the U.S.). Lastly, Model 3 is the full specification that includes the standard controls, number of years in the U.S., and state fixed effects.[8]

4.B Results

From the first model specification, we observe that both male and female immigrants earn less than their native-born counterparts. Male immigrants earn 5 percent less in wages than native males, while female immigrants earn 2 percent less in wages than native females. This wage disadvantage for immigrants is seen in almost all regression specifications. Also, workers employed in high immigrant industries earn less than workers elsewhere. The gap is about 1.5 percent for men and 3 to 4 percent for women. Finally, the interaction effects for immigrant industries show that immigrant men tend to earn relatively less in high immigrant industries (about 1 to 2 percent less), whereas immigrant women actually have a relative wage advantage (about 5 to 6 percent more) in high immigrant industries compared to those workers employed in low immigrant-intensive industries.

The regression results also show that both immigrant and native workers' wages increased after the change in the minimum wage rate. The coefficients of interest are the estimated coefficients on the post-indicator variable and the interaction terms that include the post-indicator variable. The regression results of the first model for natives show that their wages rose by 7 to 8 percent after the increase in the minimum wage. The coefficient on the two-way interaction between immigrant status and the post-indicator variable, *post*immigrant*, are small and statistically insignificant, but they tend to show a relative decline in immigrant wages after the rise in the minimum wage. Taken as a whole, these results indicate that

[8] Since some state minimum wage rates are set above the federal rate it is warranted to control for these state variations with the inclusion of state dummies.

immigrants' wages rose from this recent increase in the minimum wage—immigrant workers do not earn any less or more than do natives after the change in the minimum wage.

Interestingly, the wages of both male and female immigrants who are employed in high immigrant-intensive industries after the change in the minimum wage rate are unaffected. This result is consistent for all model specifications, and is interesting in light of the notion of differential adherence by the firm to minimum wage laws across immigrant and native workers. As shown in Table 2, these immigrants tend to be less educated and have far fewer years in the U.S.; one would expect non-compliance, if it exists, to specifically affect this immigrant population. In fact, the coefficient on the third level interaction between the post-change indicator variable for all model specifications is very small and statistically indistinguishable from zero.

5. Assessing Minimum Wage Compliance: Two Approaches

In this section two alternative approaches are presented to test for the existence of non-compliance towards immigrant workers during the first 12 months of new enacted minimum wage rate. The first approach employs a probit regression analysis on the probability of being paid less than the new enacted minimum wage rate. The second approach follows the Ashenfelter-Smith non-compliance method, which calculates the actual compliance rate.

First Approach: A Probit Regression Analysis

The first approach to test for non-compliance estimates the following probit model:

$$\begin{aligned}\Pr(\$5.15<wage)_i = \Phi[&\alpha_0 + \beta_1 Post_i + \beta_2 Immigrant_i + \beta_3 High_i + \beta_4 Post_i{*}Immigrant_i \\ &+ \beta_5 Post_i{*}High_i + \beta_6 Immigrant_i{*}High_i + \beta_7 Post_i{*}Immigrant_i{*}High_i \\ &+ X_i\psi + USYRS_i\varphi + State_i\chi + \mu_i] \qquad (2)\end{aligned}$$

where Pr(*$5.15<wage*)$_i$ is a dummy variable indicating worker *i* is paid less than the new enacted minimum wage rate. All of the variables in equation (2) are defined as previously stated for equation (1).

For ease of interpretation, Table 4 reports the marginal effects from the probit estimation of three versions of equation (2). Again, models are estimated separately for both males and females. Model 1 in Table 4 shows that log hourly wages for natives are less likely to be below the new enacted minimum rate. For native males and females, a 4 and 8 percent decline in the post-change period compared to the pre-change period is observed. These results are also seen in both Models 2 and 3 after including the full set of controls. Male and female immigrants are no more likely to earn wages below the new enacted minimum wage rate compared to natives—that is, for both male and female immigrants, a 3 and 7 percent decline in the probability of being paid less than $5.15 in the post-change period is also observed.

After the enactment of the new minimum wage, both native-born males and females who are employed in industries with high immigrant concentration are 4 to 7 percent less likely to earn wages below $5.15. Contrary to the belief that immigrants who work in industries with high immigrant employment would most likely suffer from wages lower than the mandated federal wage rate due to lack of compliance towards them, there seems to be no evidence of non-compliance. In fact, all the regressions show that immigrant workers employed in high immigrant-intensive industries are less likely to earn wages less than the new enacted minimum rate. More specifically, Model 1 shows both male and female immigrants have a lower probability of being paid less than the new enacted minimum wage rate. The estimated difference-in-difference-in-difference effects (i.e., coefficient β_7) are -0.0067 and -0.0189 for

male and female immigrants, respectively (significant at the 1 percent level for female immigrants only). This result is observed in all the model specifications.

Second Approach: Ashenfelter-Smith Compliance Rate

The second approach estimates the compliance rate by nativity and distinguishes between immigrants who are citizens and those who are non-citizens. This compliance rate, first introduced by Ashenfelter and Smith (1979), is defined as the total number of workers earning at least the minimum wage after the enactment of the law. However, this measure is imperfect because it does not take into account the fact that most of these workers would have earned the minimum wage even in the absence of the law. As Ashenfelter and Smith have pointed out, an ideal measure of compliance should instead ascertain the proportion of workers earning below the minimum wage before the enactment of the new minimum wage or workers who have lost their jobs in a given sector after the enactment of the law. That is, an ideal measure of compliance can be defined as:

$$C^* = \frac{\eta_1 - \eta_0 - \Delta L}{\pi_0}$$

where C^* denotes the ideal compliance rate; η_1 and η_0 denote the number of workers earning exactly the minimum wage in the presence and absence of the minimum wage law; ΔL denotes the change in employment resulting from the enactment of the law; and π_0 denotes the numbers of workers earning less than the minimum wage in the absence of the minimum wage law. Unfortunately, the problem with C^* is that one cannot ascertain the values for η_0, π_0, and ΔL, the number of workers losing their jobs due to the enactment of the law. Hence, the second best approximation of C^* is estimated:

$$C' = \frac{\eta_1}{\eta_1 + \pi_1}$$

where π_1 denotes the numbers of workers earning less than the minimum wage in the presence of the minimum wage law. That is, C' is the number of workers earning exactly the new minimum wage divided by the total number of workers earning below the new minimum wage.[9]

The estimates of compliance rate C' are shown in Table 5 for males and females. For purposes of comparison, two wage rate variables are presented in these tables because imputed hourly wage rates are known to be noisy and lead to the underestimation of the compliance rate. The first wage rate variable, which is used throughout the paper, is the actual hourly wage rate or the imputed hourly wage rate for workers who did not report an hourly wage rate in the CPS; the second wage rate variable is the hourly wage rate in the CPS. In Table 5, a higher compliance rate for native males relative to immigrant males is observed in both high and low immigrant industries. The compliance rate is about 28 percent for native males and about 20 percent for immigrant males. In low immigrant industries the compliance rate for male immigrants with citizenship is slightly higher with 23 percent. Interestingly, in high immigrant industries, male immigrants who are citizens have a lower compliance rate compared to male immigrants who are non-citizens.

The relevant comparison one should be making, however, is across low and high immigrant-intensive industries. This comparison more likely would show a differential adherence of the minimum wage law, if one exists, than comparing natives and immigrants within each low and high immigrant industry. This comparison shows that in general the

[9] This expression is attained assuming the following conditions. First, in the absence of the law there exist no workers earning exactly the minimum wage, η_0=0. Second, the enactment of the new minimum wage does not cause unemployment of workers, ΔL=0. Lastly, our definition of $\eta_0 + \pi_0 - \Delta L = \eta_1 + \pi_1$ yields that $\eta_0 = \eta_1 + \pi_1$. For a more detailed derivation refer to the original text by Ashenfelter and Smith (1979).

compliance rate among immigrants is about the same. The calculated compliance rate for male immigrants in low immigrant concentration industry is 19 percent versus 20 percent for male immigrants in high immigrant concentration industry. We observe the same pattern of compliance rates for native and immigrant females for both the low and high immigrant industry samples.

Overall, there seems to be no pattern of non-compliance in the case of immigrants who work in low or high immigrant industries. Furthermore, there seems to be no evidence of non-compliance for non-citizen immigrants in high immigrant industries. In fact, these results are consistent with the earlier probit regression analysis that shows immigrants are indeed earning higher wages after the enactment of the new minimum wage. Looking at the hourly wage compliance rate, we see a higher compliance rate among all groups. This is to be expected, given that the hourly wage or the imputed wage introduces some noise to this variable. However, the directions of the effects stated earlier among natives and immigrants in low and high immigrant industry still hold.

6. Conclusions

This paper analyzes the most recent increase in the minimum wage rate in the U.S., which was enacted on September 1, 1997. In particular, I focus on the wage effects of immigrant workers from this recent increase in the minimum wage. This paper distinguishes between immigrants and natives who work in industries with low and high immigrant concentration, and finds that the earnings distributions of both immigrants and female natives are more compressed towards the minimum wage. After the change in the minimum wage from $4.25 to $5.15, there is considerably less density in the lower tail of the post-change distribution of log hourly wages for both natives and immigrants. In particular, male and female immigrants in high immigrant

industries are the workers that are most affected by the increase in the minimum wage. Moreover, the wages of immigrant workers employed in high immigrant industries rise at the same pace as those in the low-immigrant industries. In addition, the wages of immigrants rise as quickly as native wages.

This paper also investigates whether there is any relationship between industry non-compliance and the concentration of immigrant workers. The two procedures used to test non-compliance towards immigrants show no evidence of such incidence. In fact, female immigrants in high immigrant-intensive industries, who are worse off in the sample compared to the other groups, are the workers with the highest compliance towards them.

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Figure 1A. Native Males in Low Immigrant Industry

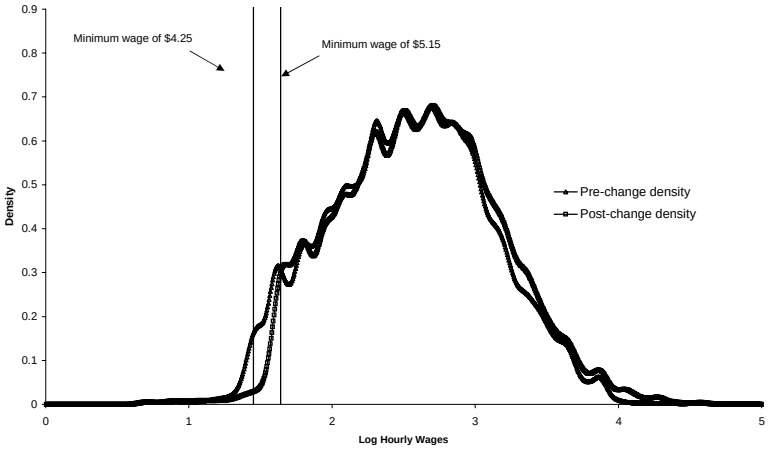

Figure 1B. Immigrant Males in Low Immigrant Industry

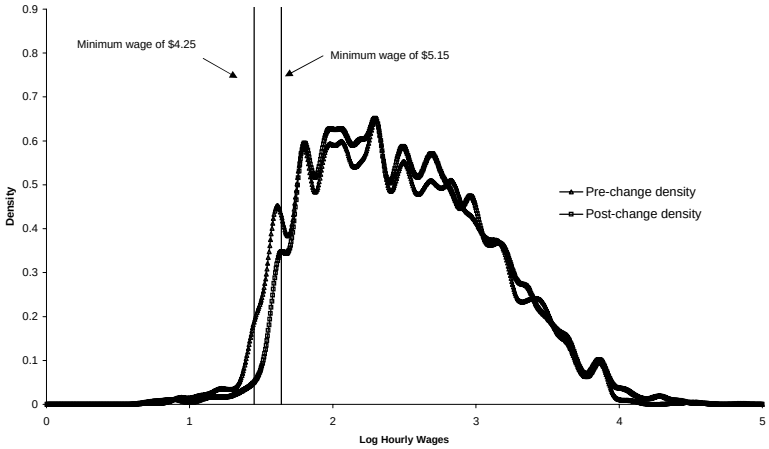

Figure 1C. Native Males in High Immigrant Industry

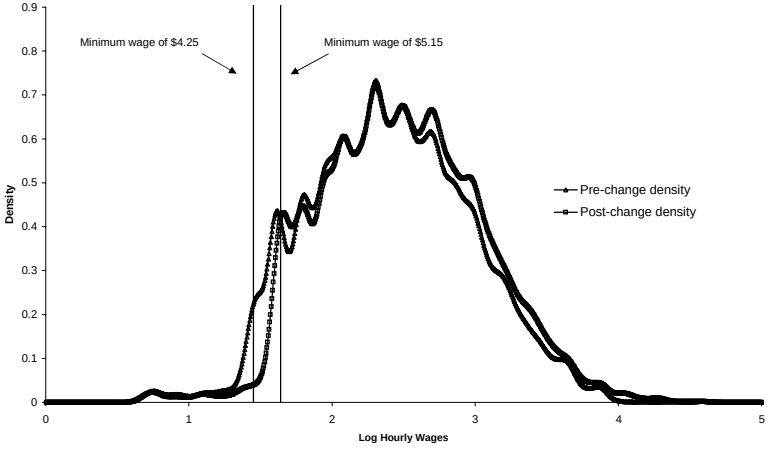

Figure 1D. Immigrant Males in High Immigrant Industry

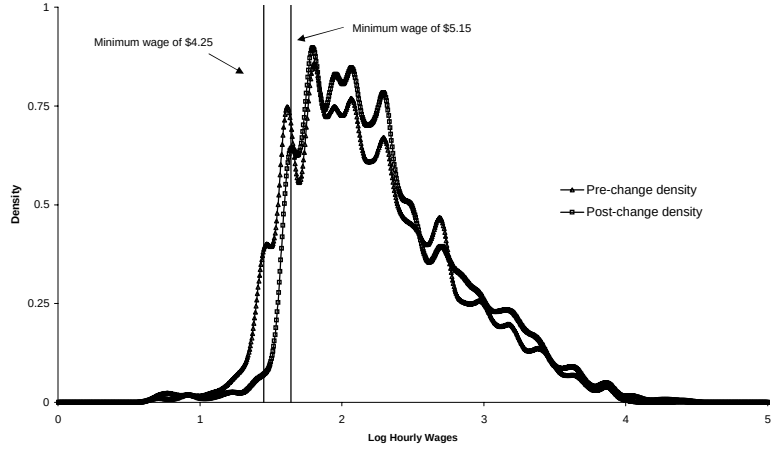

Figure 1. Kernel Densities: Log Hourly Wage (Males)

Figure 2A. Native Females in Low Immigrant Industry

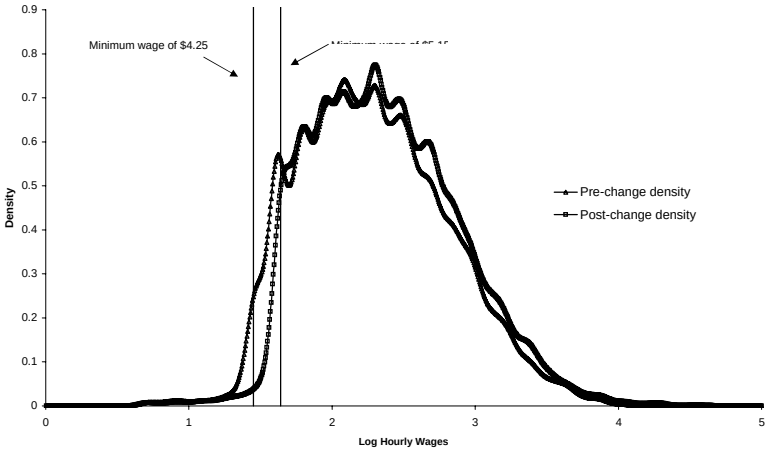

Figure 2B. Immigrant Females in Low Immigrant Industry

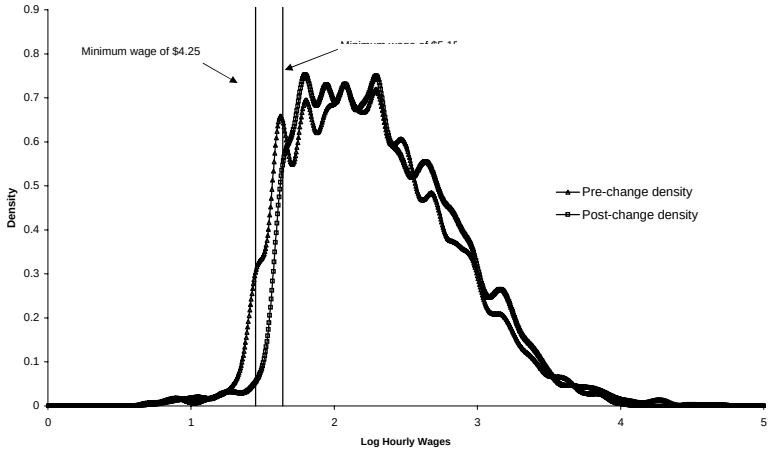

Figure 2C. Native Females in High Immigrant Industry

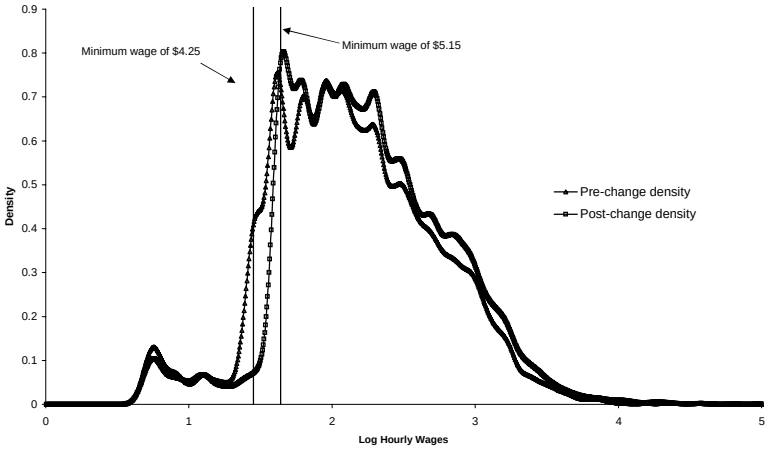

Figure 2D. Immigrant Females in High Immigrant Industry

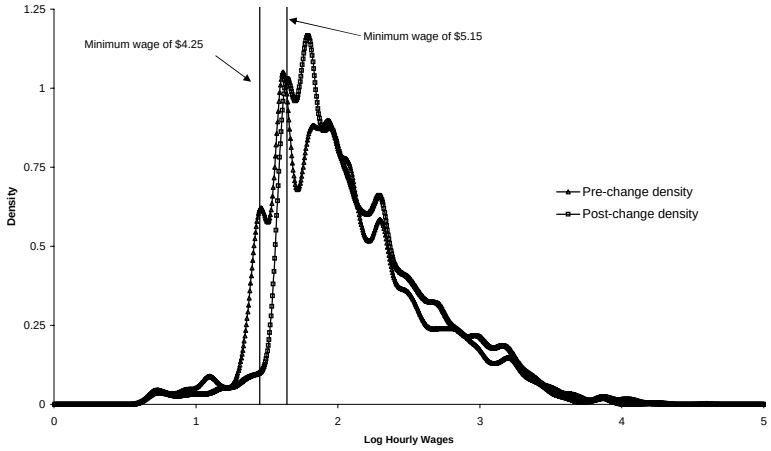

Figure 2. Kernel Densities: Log Hourly Wages (Females)

Table 1A. Percent of Workers at Different Cutoffs of the Earnings Distribution by Low and High Immigrant-Intensive Industries
(Wage = Hourly Wage or Imputed Hourly Wage)

	Low Immigrant Concentration		High Immigrant Concentration	
Male Natives	Pre-Change	Post-Change	Pre-Change	Post-Change
< $4.25	0.99	0.72	1.98	1.39
$4.25	0.00	0.00	0.00	0.00
$4.26-$5.14	4.48	1.59	6.26	2.21
$5.15	0.04	0.92	0.04	1.42
$5.16-$6.15	5.50	6.10	6.97	7.65
$6.16 +	88.99	90.67	84.75	87.33
Sample Size	42,020	41,678	26,369	26,741
Male Immigrants	Pre-Change	Post-Change	Pre-Change	Post-Change
< $4.25	1.61	1.10	3.13	1.54
$4.25	0.00	0.00	0.00	0.00
$4.26-$5.14	6.48	3.10	10.44	4.86
$5.15	0.06	1.00	0.07	1.68
$5.16-$6.15	8.60	7.06	11.78	13.43
$6.16 +	83.25	87.74	74.58	78.49
Sample Size	3,535	3,905	4,472	4,938

Source: Monthly files from the Current Population Survey data for 1995, 1996, 1997, and 1998.
Notes: The pre-change period is defined as the last 12 months of the old minimum wage regime at $4.25 (i.e., October 1995 to September 1996). The post-change period is defined as the first 12 months of the new minimum wage regime at $5.15 (i.e., September 1997 to August 1998).

Table 1B. Percent of Workers at Different Cutoffs of the Earnings Distribution by Low and High Immigrant-Intensive Industries
(Wage = Hourly Wage or Imputed Hourly Wage)

	Low Immigrant Concentration		High Immigrant Concentration	
Female Natives	Pre-Change	Post-Change	Pre-Change	Post-Change
< $4.25	1.48	0.96	5.48	4.86
$4.25	0.00	0.00	0.00	0.00
$4.26-$5.14	7.76	2.28	10.46	3.96
$5.15	0.10	1.66	0.12	2.94
$5.16-$6.15	9.84	10.30	11.14	13.02
$6.16 +	80.82	84.80	72.80	75.22
Sample Size	46,550	46,829	20,195	20,491
Female Immigrants	Pre-Change	Post-Change	Pre-Change	Post-Change
< $4.25	2.07	1.44	4.96	3.53
$4.25	0.00	0.00	0.00	0.00
$4.26-$5.14	8.71	3.54	14.04	7.74
$5.15	0.15	1.50	0.18	2.94
$5.16-$6.15	10.93	12.17	12.25	18.24
$6.16 +	78.14	81.35	68.57	67.55
Sample Size	3,238	3,392	2,841	3,371

Source: Monthly files from the Current Population Survey data for 1995, 1996, 1997, and 1998.
Notes: The pre-change period is defined as the last 12 months of the old minimum wage regime at $4.25 (i.e., October 1995 to September 1996). The post-change period is defined as the first 12 months of the new minimum wage regime at $5.15 (i.e., September 1997 to August 1998).

Table 2. Mean Characteristics of the PRE and POST Enactment Sample for Low and High Immigrant-Intensive Industries by Nativity and Gender

	Low Immigrant Concentration				High Immigrant Concentration			
	Natives		Immigrants		Natives		Immigrants	
Male Sample	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Log Hourly Wage	2.54	2.61	2.45	2.51	2.41	2.49	2.21	2.30
	(0.57)	(0.57)	(0.61)	(0.60)	(0.57)	(0.56)	(0.57)	(0.56)
Education	13.66	13.67	13.15	13.11	12.83	12.86	11.04	11.12
	(2.37)	(2.36)	(3.67)	(3.66)	(2.17)	(2.15)	(4.07)	(4.05)
Age	38.53	38.72	38.16	38.16	36.28	36.42	36.32	36.58
	(11.72)	(11.84)	(11.23)	(11.24)	(11.83)	(11.88)	(11.08)	(11.03)
Married	0.64	0.62	0.69	0.68	0.57	0.55	0.67	0.66
	(0.48)	(0.49)	(0.46)	(0.47)	(0.50)	(0.50)	(0.47)	(0.47)
Years in U.S.	--	--	16.14	16.36	--	--	13.46	13.58
			(11.20)	(11.27)			(9.87)	(9.89)
N	83,698		7,440		53,212		9,433	
	Natives		Immigrants		Natives		Immigrants	
Female Sample	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Log Hourly Wage	2.29	2.37	2.27	2.34	2.16	2.24	2.04	2.17
	(0.52)	(0.52)	(0.54)	(0.54)	(0.57)	(0.57)	(0.53)	(0.53)
Education	13.64	13.66	13.49	13.43	12.88	12.99	11.48	11.52
	(2.19)	(2.19)	(2.89)	(3.05)	(2.06)	(2.08)	(3.87)	(3.78)
Age	38.15	38.46	38.51	38.75	36.50	36.64	38.35	38.97
	(11.64)	(11.83)	(11.42)	(11.44)	(12.03)	(12.12)	(11.10)	(11.10)
Married	0.58	0.57	0.61	0.61	0.51	0.49	0.62	0.63
	(0.49)	(0.50)	(0.49)	(0.49)	(0.50)	(0.50)	(0.49)	(0.48)
Years in U.S.	--	--	17.51	17.58	--	--	14.72	15.73
			(11.39)	(11.39)			(10.27)	(10.58)
N	93,379		6,630		41,364		6,490	

Source: Monthly files from the Current Population Survey data for 1995, 1996, 1997, and 1998.
Notes: The pre-change period is defined as the last 12 months of the old minimum wage regime at $4.25 (i.e., October 1995 to September 1996). The post-change period is defined as the first 12 months of the new minimum wage regime at $5.15 (i.e., September 1997 to August 1998).

Table 3. Regression Results for Log Hourly Wages by Gender

	Model 1		Model 2		Model 3	
	Males	Females	Males	Females	Males	Females
Constant	-0.1864***	0.0669	-0.2229**	0.0493	-0.1239	0.3197***
	(0.0928)	(0.0939)	(0.0929)	(0.0939)	(0.0918)	(0.0924)
Immigrant Status Indicator	-0.0557***	-0.0202**	-0.0104	-0.0151	-0.0461***	-0.0609***
	(0.0079)	(0.0081)	(0.0108)	(0.0112)	(0.0107)	(0.0111)
High Immig. Industry Indicator	-0.0150***	-0.0385***	-0.0153***	-0.0386***	-0.0147***	-0.0322***
	(0.0036)	(0.0038)	(0.0036)	(0.0038)	(0.0035)	(0.0037)
Immigrant*High Immig. Ind.	-0.0208*	0.0489***	-0.0092	0.0589***	-0.0126	0.0482***
	(0.0108)	(0.0120)	(0.0108)	(0.0121)	(0.0107)	(0.0118)
Post-Change Indicator	0.0712***	0.0763***	0.0712***	0.0764***	0.0725***	0.0778***
	(0.0031)	(0.0029)	(0.0031)	(0.0029)	(0.0031)	(0.0029)
Post-Change*Immigrant	-0.0071	0.0023	-0.0093	$-2.053e^{-5}$	-0.0078	-0.0003
	(0.0110)	(0.0113)	(0.0110)	(0.0113)	(0.0108)	(0.0111)
Post-Change*High Immig. Ind.	0.0106**	0.0033	0.0106**	0.0033	0.0106**	0.0012
	(0.0050)	(0.0053)	(0.0050)	(0.0053)	(0.0049)	(0.0052)
Post-Change*Immigrant*High	0.0011	$6.129e^{-5}$	0.0014	-0.0017	0.0027	0.0040
	(0.0149)	(0.0168)	(0.0149)	(0.0168)	(0.0147)	(0.0164)
Less than 5 years in the U.S.	--	--	-0.0882***	-0.1002***	-0.0874***	-0.1067***
			(0.0115)	(0.0135)	(0.0113)	(0.0133)
Between 5-10 years in the U.S.	--	--	-0.1019***	-0.0504***	-0.1127***	-0.0730***
			(0.0109)	(0.0122)	(0.0107)	(0.0119)
Between 11-15 years in the U.S.	--	--	-0.0849***	-0.0086	-0.0969***	-0.0339**
			(0.0123)	(0.0135)	(0.0121)	(0.0133)
Between 16-20 years in the U.S.	--	--	-0.0502***	0.0035	-0.0621***	-0.0169
			(0.0121)	(0.0130)	(0.0120)	(0.0126)
More than 21 years in the U.S.	--	--	0.0222***	0.0529***	0.0099	0.0348***
			(0.0087)	(0.0090)	(0.0086)	(0.0089)
Standard Controls [a]	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects [b]	No	No	No	No	Yes	Yes
Observations	153,567	145,921	153,567	145,921	153,567	145,921
Adjusted R^2	0.3820	0.3309	0.3828	0.3317	0.4004	0.3575

Source: Monthly files from the Current Population Survey data for 1995, 1996, 1997, and 1998.

*** Statistically significant at the 1 percent level.

** Statistically significant at the 5 percent level.

* Statistically significant at the 10 percent level.

Notes: Standard errors in parentheses. The pre-change period is defined as the last 12 months of the old minimum wage regime at $4.25 (i.e., October 1995 to September 1996). The post-change period is defined as the first 12 months of the new minimum wage regime at $5.15 (i.e., September 1997 to August 1998). [a] The standard controls included in each regression specification are: age, age^2, age^3, age^4, marital, and educational attainment. [b] 50 state dummies plus the District of Columbia.

Table 4. Probit Regression Results for Being Paid Less than the New Minimum Wage Rate by Gender (Marginal Effects)[†]

	Model 1		Model 2		Model 3	
	Males dF/dx	Females dF/dx	Males dF/dx	Females dF/dx	Males dF/dx	Females dF/dx
Immigrant Status Indicator	0.0212***	0.0142***	0.0062*	0.0098*	0.0054	0.0140**
	(0.0034)	(0.0043)	(0.0039)	(0.0061)	(0.0038)	(0.0063)
High Immig. Ind. Indicator	0.0068***	0.0327***	0.0069***	0.0327***	0.0070***	0.0316***
	(0.0012)	(0.0020)	(0.0012)	(0.0020)	(0.0012)	(0.0019)
Immigrant*High Immig. Ind.	0.0065**	-0.0043	0.0045	-0.0064	0.0044	-0.0045
	(0.0035)	(0.0050)	(0.0034)	(0.0049)	(0.0033)	(0.0049)
Post-Change Indicator	-0.0389***	-0.0801***	-0.0389***	-0.0799***	-0.0381***	-0.0786***
	(0.0014)	(0.0018)	(0.0014)	(0.0018)	(0.0014)	(0.0018)
Post-Change*Immigrant	0.0069**	0.0136**	0.0066	0.0140**	0.0066*	0.0137**
	(0.0044)	(0.0071)	(0.0044)	(0.0072)	(0.0043)	(0.0071)
Post-Change*High Immig. Ind.	-0.0021	0.0136***	-0.0021	0.0135***	-0.0021	0.0136***
	(0.0019)	(0.0031)	(0.0019)	(0.0031)	(0.0018)	(0.0030)
Post-Change*Immigrant*High	-0.0067	-0.0189***	-0.0070	-0.0195***	-0.0067	-0.0198***
	(0.0041)	(0.0064)	(0.0040)	(0.0064)	(0.0039)	(0.0061)
Less than 5 years in the U.S.	--	--	0.0278***	0.0423***	0.0276***	0.0468***
			(0.0057)	(0.0092)	(0.0057)	(0.0095)
Between 5-10 years in the U.S.	--	--	0.0267***	0.0163***	0.0268***	0.0211***
			(0.0054)	(0.0070)	(0.0054)	(0.0072)
Between 11-15 years in the U.S.	--	--	0.0183***	-0.0017	0.0178***	0.0022
			(0.0055)	(0.0066)	(0.0054)	(0.0067)
Between 16-20 years in the U.S.	--	--	0.0118***	0.0012	0.0110***	0.0049
			(0.0049)	(0.0064)	(0.0047)	(0.0066)
More than 21 years in the U.S.	--	--	-0.0018	-0.0144***	-0.0013	-0.0110**
			(0.0030)	(0.0041)	(0.0030)	(0.0042)
Standard Controls [a]	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects [b]	No	No	No	No	Yes	Yes
Observations	153,567	145,921	153,567	145,921	153,567	145,921
Pseudo R^2	0.2047	0.1682	0.2059	0.1692	0.2139	0.1806

Source: Monthly files from the Current Population Survey data for 1995, 1996, 1997, and 1998.

*** Statistically significant at the 1 percent level.

** Statistically significant at the 5 percent level.

* Statistically significant at the 10 percent level.

Notes: [†]For ease of interpretation the marginal effects are shown instead of the estimated probit coefficients. Reported are the estimated changes in the probability of "being paid less than $5.15" for infinitesimal changes in continuous variables and discrete change in the probability for dummy variables. Standard errors in parentheses. The pre-change period is defined as the last 12 months of the old minimum wage regime at $4.25 (i.e., October 1995 to September 1996). The post-change period is defined as the first 12 months of the new minimum wage regime at $5.15 (i.e., September 1997 to August 1998). [a] The standard controls included in each regression specification are: age, age^2, age^3, age^4, marital, and educational attainment. [b] 50 state dummies plus the District of Columbia.

Table 5. Ashenfelter-Smith Compliance Rates*
by Low and High Immigrant-Intensive Industries (Percent)

	Low Immigrant Concentration Compliance Rate		High Immigrant Concentration Compliance Rate	
Male Sample	Hourly Wage or Imputed Hourly Wage	Hourly Wage	Hourly Wage or Imputed Hourly Wage	Hourly Wage
Natives	27.94	41.50	27.97	36.14
Immigrants	19.21	35.14	20.45	31.18
Citizens	23.53	38.71	17.74	27.50
Non-citizens	17.76	33.75	20.94	31.84
Female Sample				
Natives	33.28	46.88	26.35	30.38
Immigrants	23.08	35.92	24.43	33.22
Citizens	17.95	29.79	22.83	32.31
Non-citizens	25.87	38.95	24.92	33.48

Source: Monthly files from the Current Population Survey data for 1997 and 1998.
Note: *The compliance rate is defined as the number of workers at the minimum wage divided by the number of workers earning less than or equal to the minimum wage after post-enactment.

Appendix

Table A.1 Mean Ranking of Industries by Immigrant Concentration

Industry Name—CPS industry Code	No. Immigrant Observations in Industry *j*	No. Observations in Industry *j*	Percentage of Immigrant Workers	Rank	Cumulative	Cumulative Percentage
MFG Not Specified Metal Ind.—10	16	35	0.4571	1	16	0.0005455
MFG, Apparel—22	859	2247	0.3823	2	875	0.0298299
Good Products Other Agricultural—2	600	2455	0.2444	3	1475	0.0502847
MFG Miscellaneous—18	275	1210	0.2273	4	1750	0.0596598
Personal Services—40	1463	7247	0.2019	5	3213	0.1095353
Goods Producing Agric. Services—1	352	1801	0.1954	6	3565	0.1215355
MFG Food—19	800	4502	0.1777	7	4365	0.1488085
MFG Leather—28	52	333	0.1562	8	4417	0.1505813
MFG Elec. Mach—12	745	4795	0.1554	9	5162	0.1759793
MFG Toys—17	61	393	0.1552	10	5223	0.1780588
Eating Places—33	2471	16057	0.1539	11	7694	0.2622984
MFG Rubber—27	305	2171	0.1405	12	7999	0.2726963
MFG—16	261	1905	0.1370	13	8260	0.2815941
MFG Textile Products—21	201	1476	0.1362	14	8461	0.2884465
MFG Furniture—6	190	1518	0.1252	15	8651	0.2949238
Business Services—38	1523	12135	0.1252	16	10174	0.3468449
Auto Repair Service—39	500	4037	0.1239	17	10674	0.3638905
MFG Fabricated Metals—9	383	3237	0.1183	18	11057	0.3769475
MFG Aircraft & Parts—14	125	1085	0.1152	19	11182	0.3812089
MFG Chemicals & Allied Prod.—25	384	3391	0.1132	20	11566	0.3942999
MFG Machinery—11	642	6156	0.1043	21	12208	0.4161865
Hospitals—42	1468	14119	0.1039	22	13676	0.4662326
Construction—4	1587	16008	0.0991	23	15263	0.5203355
Wholesale Trade—32	1068	11305	0.0945	24	16331	0.5567449
Banking, Other Finance—35	832	9381	0.0887	25	17163	0.5851089
MFG Primary Metals—8	164	1850	0.0886	26	17327	0.5906999
Health Services—43	1337	15201	0.0879	27	18664	0.6362799
Transportation—29	1201	13755	0.0873	28	19865	0.6772236
Entertainment & Rec. Services—41	452	5327	0.0849	29	20317	0.6926329
MFG Other Transportation equip—15	117	1424	0.0822	30	20434	0.6966216
Insurance & Real Estate—36	804	9898	0.0812	31	21238	0.7240309
MFG Paper, Allied Products—23	141	1742	0.0809	32	21379	0.7288378
MFG Stone, Clay, Concrete—7	112	1411	0.0794	33	21491	0.7326561
Other Retail Trade—34	2790	35506	0.0786	34	24281	0.8277708
MFG Motor vehicles & Equip.—13	251	3213	0.0781	35	24532	0.8363277
MFG Printing, Publish—24	334	4316	0.0774	36	24866	0.8477142
National Security, Intl. Affairs—50	142	1857	0.0765	37	25008	0.8525551
Other Professional Services—46	948	12540	0.0756	38	25956	0.8848737
Communications—30	293	4429	0.0662	39	26249	0.8948624
MFG Petroleum, Coal Products—26	30	465	0.0645	40	26279	0.8958852
Social Services—45	436	6794	0.0642	41	26715	0.9107499
Educational Services—44	1712	27842	0.0615	42	28427	0.9691133
MFG Lumber, Wood Products—5	117	2001	0.0585	43	28544	0.9731019
Forestry, Fisheries—47	19	333	0.0571	44	28563	0.9737497
Admin. HR Program—49	127	2356	0.0539	45	28690	0.9780793
Other Public Administration—51	244	5845	0.0417	46	28934	0.9863976
Utilities, Sanitary Services—31	154	4094	0.0376	47	29088	0.9916476
Mining—3	66	2046	0.0323	48	29154	0.9938977
Justice, Public Order—48	176	6088	0.0289	49	29330	0.9998977
MFG Tobacco Products—20	3	128	0.0234	50	29333	1
Total No. Observations	29,333	299,460				

Source: Monthly files from the Current Population Survey (CPS).
Note: CPS 1995, 1996, 1997, 1998 Codebook.