Economic Policy Institute

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Interim Report

on

Minimum Wage Effects on Rural Labor Markets

to

The Ford Foundation

from

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In 1992, the Economic Policy Institute (EPI) embarked on an eighteen month research project to study the link between the minimum wage and the distribution of wages among rural low-wage workers. The project, ***Minimum Wage Effects on Rural Labor Markets***, seeks to provide new insights about the effectiveness of the minimum wage as a policy tool and the effect of a changing minimum wage on low-wage rural workers. The project will produce information crucial to the development of rural wage and income policies including improved data on the distribution of wages and the types of jobs available in rural labor markets. This research will also help to promote better understanding of the causes of rural poverty. Support for this project was provided by the Ford Foundation's Rural Poverty and Resources Program in conjunction with the Aspen Institute's Rural Economic Policy Program.

In the first year of the project, EPI conducted basic exploratory data work on the minimum wage and its relation to the distribution of wages in non-metropolitan areas. Preliminary results were presented at two academic conferences, and a technical paper was drafted about firm specific responses to changes in the minimum wage. A copy of the draft is attached.

At the Eastern Economic Association Meetings held in March 1992 in New York, William Spriggs, the project's lead investigator, presented "Wage Distribution Changes for New Workers, 1979-1991." The presentation concentrated on the hourly wages of recent high school graduates. It showed that the decline in real wages (wages adjusted for the change in purchasing power resulting from inflation) for high school graduates since 1979 was the result of an increase in the number of workers at the bottom of the wage scale, more than a decrease in the number of workers at the top. Most of the increase in low wage work by recent high school graduates took place at wage levels below the purchasing power of the 1979 minimum wage. Using regression analysis, the presentation broke down the change in the wages of recent high school graduates into elements representing the change in their occupations, industries, location, and inner city residence. Though the change in the mix of occupations for the jobs filled by recent high school graduates could explain a large part of the decline in their real hourly wages, a greater share of the decline could be explained by the erosion of the purchasing power of the minimum wage.

This presentation established the database for analyzing the segment of the labor market most affected by the minimum wage. The statistical work set up the model for separating the causes of wage declines from among changes in: (1) the demand

for workers (by occupation and industry); (2) shifts in the location of work (geographic region and metropolitan residence); (3) composition of the work force (by race and sex); and (4) changes in the minimum wage. Establishing this database and technique for the broader national trends enables the project to now focus on the specifics of non-metropolitan areas and to compare the difference between the national trend and the non-metropolitan trend.

A second presentation was made at the American Statistical Association Winter Conference, held in January 1993 in Fort Lauderdale. The conference theme was "Families and Children: Research Findings, Data Needs, and Survey Issues." William Spriggs and Bruce Klein, an Economist at the Department of Agriculture, presented "A Decade of Low Pay, Low Wage Workers and Their Families."

This presentation centered on characteristics of minimum wage workers, the sources of labor income for households with minimum wage workers, and the relationship between the minimum wage and the wages of other workers. Minimum wage workers are more likely to work in the service sector than non-minimum wage workers, and minimum wage workers are more likely to live in poor households than non-minimum wage workers. During the period 1979 - 1989, both of these facts became increasingly true.

Building on the finding of the earlier presentation about an increase in high school educated workers earning less than the purchasing power of the 1979 minimum wage, this presentation showed why the minimum wage affects non-minimum wage workers. The presentation identified almost 45 occupation/industry groupings that had wages strongly related to the minimum wage. In many of those occupation/industry groupings, workers made well above the minimum wage. Still, the wages of those workers had a constant relationship with the nominal value of the minimum wage. For example, operators and assemblers who work in the business and repair service industry had a premium of around $3.00 over the minimum wage. Other occupation/industry groups were found to cluster around the average non-supervisory wage (about 25 such groups), and an almost equal number did not cluster around either the average wage or the minimum wage. Using the minimum wage cluster as the definition of minimum wage workers increases the share of minimum wage workers almost by a factor of five; and, between 1979 and 1989, there was an increase in the share of less than college educated workers who fell in the occupation/industry groups that were in the minimum wage cluster. This suggests

that not increasing the nominal value of the minimum wage may have had a large role in stagnating the nominal wages of less than college educated workers despite the increase in employment during the 1980s' recovery.

This presentation identified the major characteristics of minimum wage workers and helped to identify which workers' wages were most related to the minimum wage. With this additional information, it will be possible for the project to proceed with estimating the special effects of the federal minimum wage on the wage structure of non-metropolitan areas.

Thus, the basic work of the project was shared with the research community. This serves as a quality check for the project. It ensures that the technical aspects of the project will meet the standards of the research community most familiar with this topic.

In August 1992, William Spriggs drafted a paper using the data collected on the minimum wage and employment in Jackson, Mississippi and Greensboro, North Carolina. This draft, with possible revision, will be released as a technical paper by the Economic Policy Institute. Unlike the other research for this project that is based on data on individual workers collected by the Census Bureau for the Bureau of Labor Statistics, this paper used data from individual firms. This paper looks at the response of firms to changes in the minimum wage. The major finding is that the increase in the minimum wage did not lead to a decrease in employment.

The final six months of the project will build on these three earlier pieces. This will result in a paper that will circulate beyond the research community and into the policy community. Given that legislation to increase the minimum wage is currently pending in the U.S. House of Representatives Education and Labor Committee and will certainly be an important element of the new Administration's economic agenda, this research is expected to make a timely contribution to informing the policy debate about how to improve rural labor markets.

The Effects of Changes in the Federal Minimum Wage: Restaurant Workers in Mississippi and North Carolina

Economists are familiar with the argument that the minimum wage is an inefficient market intrusion.[1] Using the common wisdom that minimum wages are harmful, many policy analysts predicted that changing the minimum wage in 1990 and 1991 would have disastrous effects (Bartlett 1987, Kibbe 1988, Testa-Ortiz 1987, McKenzie and Simon 1987). Now, new research by economists on the minimum wage is calling the conventional view into question. In particular, work by David Card (1992a, 1992b) Lawrence Katz and Alan Krueger (1991a, 1992) and Allison Wellington (1991) all fail to find statistically significant negative effects on employment from increases in the minimum wage that took place in the late 1970s, and the early 1990s. These findings are much stronger because each of the authors used different methodologies. Card looks at aggregate time series data for states, and cross-sectional data for individuals. Katz and Krueger based their analysis on firm-specific data. Wellington followed individuals in a longitudinal study. This result has also been obtained for at least one foreign country by Stephen Bazen and John Martin (1991), looking at the effect of the French minimum wage found no influence on adult employment and no robust estimate for youth.

This paper reports on research that closely replicates Katz and Krueger's research on fast food restaurants in Texas. This study looks at restaurants in Jackson, Mississippi and Greensboro, North Carolina. Restaurants were surveyed by telephone during March, 1991 preceding the increase in the federal minimum wage, and surveyed again in late April, 1991 following the increase. Students at Jackson State University and North Carolina Agricultural and Technical State University conducted the survey. Alan Krueger consulted on the development of the questionnaire so that many of the same questions would be asked. This assured the comparability of major findings between the Katz and Krueger research and this paper. However, this survey expanded on the work of Katz and

Krueger by asking some additional questions about wage distribution and labor turnover. Thus, it was possible to investigate how changes in the minimum wage affected the firm's wage structure, and to control for changes in employment level using the firm's labor turnover rate.

A change in the minimum wage creates a natural experiment. But taking advantage of a change in the minimum wage presents a challenge in designing the proper experiment. If the researcher waits too long after the minimum wage change to gather data to measure the effect of the change, intervening changes in the macroeconomy makes it difficult to argue that economic conditions were held constant. If the researcher returns too quickly after the minimum wage changes to gather data, then it is hard to determine if the full effects of the change have been measured. In this case, the problem of controlling for economic conditions appeared the greater problem. The high turnover rate of workers in the restaurant industry makes it more likely that these firms could make changes in wages and employment quickly.

The legislation that led to the increases in the minimum wage under study in this paper passed in 1989. So, firms had two years prior knowledge how their wage structure would be affected. Further, the firms had the previous experience of the 1990 wage increase, which the same legislation mandated. So, while the survey covers only a short period, it may be safe to assume that the actions studied reflect longer term thinking by the firm. And, the marked differences in the behavior of firms after the change in the minimum wage found in this study, make it clear that the firms did not incorporate all planned changes before the survey dates. The conclusions about the impact of the change in the minimum wage on employment and prices based on this survey are consistent with those of Katz and Krueger in their work on fast food restaurants in Texas; though their study and this one differ in the timing between the follow-up survey and the change in the minimum wage. Thus, the shorter survey period of this study does not appear to invalidate its findings.

The paper is organized as follows: Section I gives background on the wage

distribution of the workers in the food service industry nationally, and of the general work force in Mississippi and North Carolina; Section II shows how the wage structure of the restaurants surveyed in Jackson and Greensboro were changed when the minimum wage changed; Section III shows how employment levels at the restaurants changed after the minimum wage was increased and shows that labor turnover rates--not wages--were a significant variable in explaining employment changes; Section IV discusses why labor turnover rates were important; Section V looks at nonwage responses to changes in the minimum wage such as fringe benefits and work schedules; Section VI gives data on the use of the youth subminimum wage; and, Section VII concludes the paper.

The Minimum Wage and the Wage Distribution among Food Service Workers Nationally, and All Workers in Mississippi and North Carolina

Eichner (1987) describes a wage structure with reference to the key wage rate. He characterizes the key rate as the wage of the entry-level position in the most critical job cluster within an industry. The internal wage structure of a firm rests on this key rate. Differences in wages from the key wage serve to reflect the hierarchy of job tasks and seniority in the firm.

For food service occupations the minimum wage is the key wage. So, this study is not of an average labor market. Instead, this is a study of a low wage occupation in low wage states. The effects of changes in the minimum wage may be more noticeable in this study, than is true for the average American firm or worker.

The two states chosen for this study have a generally low wage structure for production workers, yet the minimum wage is not a more common wage in these states than in the nation as a whole. Still, the minimum wage relative to the prevailing wage of other production workers is greater in these two states than is the case nationally. The last full year that the minimum wage was constant was 1989. Average hourly earnings in Jackson, in October 1989 for manufacturing production workers was $9.08, while in Greensboro they were $9.20. The national

average, excluding overtime pay, was $10.08 an hour (BLS 1990). Mississippi had the second lowest average wage for any state, and North Carolina was third lowest (South Dakota was lowest.)

Yet, in 1989 among all workers paid hourly, only about five percent (5.16%) of workers in North Carolina were paid at or below the minimum wage. This number is not very different from the percentage nationally, which was also roughly five percent (5.06%) (BLS 1989). However, Mississippi is different. The percentage of hourly workers paid below the minimum is much higher than the national number.[2]

As a group, food service workers are more likely to be affected by changes in the minimum wage than most other types of workers. Nationally, among workers with food service occupations who were paid hourly, roughly one-fourth (25.37%) were paid at, or below, the minimum wage in 1989. Thus, they were five times more likely to be paid at, or below, the minimum wage than the national average. This compares with those who have retail and personal sales occupations, where roughly 8 percent (8.32%) were paid at, or below, the minimum (BLS 1989). Wages at or below the minimum wage is however less common for food service workers than for private household and farm workers.

Greensboro is a city of 196,000 people located in North Carolina's "Piedmont Triad." It is a college town, with full-time college students equal to almost eight percent of the population.[3] The "Triad" includes the cities of Winston-Salem and High Point, as well as seven counties. This MSA has a population of 931,000. In Greensboro, 402 restaurants were contacted, of which 76 provided information that is useable in this analysis.[4] In April, 1991, the Greensboro-Winston-Salem-High Point MSA had an unemployment rate of 4.8 percent (BLS 1991).

Jackson is a city of 196,600 people located in Central Mississippi. It is the capital city of Mississippi. It has a diversified economy and serves as a state and regional center for much of Mississippi. It is the main city in the Jackson SMSA having about one-half the SMSA's total population of 395,400. In April, 1991, the Jackson SMSA had an unemployment rate of 5.8 percent. So, the Greensboro

labor market was slightly tighter than that of Jackson's.

The sample in Jackson included all restaurants listed in the Yellow Pages. Each restaurant was contacted and several follow-up calls were made in each case. A total of 282 restaurants were identified. Of this total, 165 provided complete information for the March and April surveys.[5]

Changes in the Minimum Wage and Firm-Specific Wage Structure

In simulations of the effect of changes in the minimum wage, it is customary to assume that workers below the new minimum wage are pushed up to that new minimum and no further; and that workers above the new minimum would not be affected.[6] This suggests that the internal wage structure can be easily changed. It would be consistent with a "human capital" view of wage setting. Changing the minimum wage does not, in itself, change the productivity of workers—or their human capital—so, that changing the minimum wage has a very limited influence on the wage structure. This section looks at maintaining the wage structure and the proposition: changing the minimum wage changes the wage differentials by more than just flattening the lower portion. It is a first step in understanding how changing the minimum wage matters.

Following Eichner, the wage structure of the firm can be expressed as:

$$\mathbf{W} = w_b + \mathbf{W}_\Delta \tag{1}$$

where **W** is a column vector of wage rates—of length m—within the firm, and $\mathbf{W}_\Delta$ is a column vector of wage differentials corresponding to the m different job tasks and experience levels of the firms' hierarchy. The vector $\mathbf{W}_\Delta$ can be expressed as:

$$\mathbf{W}_\Delta = \{\Delta w_1 \ \Delta w_2 \ \Delta w_3 \ \ldots \ \Delta w_m\}. \tag{2}$$

In the human capital model, $\mathbf{W}_\Delta$ is not fixed. Assuming w_b is the minimum wage, the change in the minimum wage would merely collapse the Δw_i, so that:

(3) $$\textit{If } \Delta w_i + w_b^{old} \leq w_b^{new} \textit{ then } \Delta w_i = 0.$$

The difference in the Eichner-like wage norm model and the human capital model is whether $\mathbf{W}_\Delta$ is fixed or not. The variance of wages within the firm in the human capital model would decline, while in the wage norm model the variance of wages within the firm would remain constant.

Table 1 shows information on the wage distribution of the firms in our sample of Jackson and Greensboro restaurants for which this information was available (189 firms). In March, the weighted (by the number of employees) mean wage of the firms was \$4.30.[7] This was slightly above the new minimum of \$4.25. The between variance in the mean firm wage was 5.95. If only workers below the new minimum wage are affected by the change in the minimum wage, then the weighted mean wage would have increased to \$4.49 (shown as scenario 1). Such an occurrence would flatten the wage distribution at the bottom, and therefore reduce variation in the wage distribution both within firms and between firms. The between firm variation in the mean firm wage, under this scenario, would fall from 5.95 to 4.14. The within firm variation of wages would have fallen from 0.188 to 0.150. So, the internal wage structure would have charged in a marked way.

Table 1 also shows two possible scenarios for how firms could react to maintain their internal wage structure. In both scenarios firms seek to maintain their existing internal wage structure. Grossman (1983), for one, has put forth the argument that the minimum wage can serve as a key wage and so firms will seek to maintain their wage structure because this affects work effort. In scenario two, firms maintain their internal wage structure in absolute wage gaps by giving all workers a \$0.45 increase—equal to the amount given to those workers going from the old minimum to the new minimum. In scenario three, firms maintain

the internal wage structure in the percentage gap in wages by giving all workers a roughly twelve percent (11.84%) increase—equal to the percentage amount given to those workers going from the old to the new minimum. In the first case—maintaining the absolute wage differences—the mean wage for workers would become $4.75, and the measures of variance would remain the same (scenario 2). In the latter case—maintaining the percentage difference in wages—the mean wage for workers would increase to $4.79, the between variance would increase to 6.43, and the within variance would increase to 0.199 (scenario 3).

Our survey allows us to see that in April, the actual mean wage increased to $4.63, the between firm variance decreased to 2.50 and the within firm variance changed slightly to 0.191. The slight increase in the within variance is consistent with firms maintaining their wage structure by giving a percentage increase (scenario 3), as opposed to a flat increase (scenario 2). But, the new average wage is closer to the flat raise (scenario 2) than to a percentage increase in wages (scenario 3). That is, workers above the new minimum must have received raises, and those between the old minimum and the new minimum must have been pushed above the new minimum.

Because the between variance decreased by much more than any of the scenarios projected, it would appear that high wage firms did not adjust their wages as much as did lower wage firms. This is consistent with the findings of Katz and Krueger (1991b). They found that increases in the minimum wage decreased variation in the starting wages of firms in their sample.

It is clear from Table 1 that all firms did not respond by the same rule given by any of the scenarios. So, it would be important to understand what contributed to some, but not all, firms maintaining some portion of their wage structure. For instance, firms may have been motivated to maintain their wage structure if a high proportion of workers received a mandated wage increase. The higher paid, and presumably more productive workers, would have the return to their experience lowered relative to the less productive or inexperienced workers.

Or, firms with higher turnover rates may have felt that it was not necessary to maintain the wage structure because the instability in the work force made their wage structure less rigid.

The extent to which the firm maintained its wage structure is measured as the natural logarithm of ratio of the variance of wages within the firm in April to the variance of wages within the firm in March.[8] This variable serves as the dependent variable in the analysis. Included among the independent variables are two measures of how many workers are affected—(1) the natural logarithm of the proportion of workers who earned below $4.25 in March, and (2) the natural logarithm of the increase in wages necessary to raise all workers to at least $4.25 an hour. The other independent variables are the natural logarithm of the number of workers in March, the natural logarithm of the turnover rate of workers in March, the natural logarithm of the proportion of visible workers who were African-American or female, and dummy variables for the major chains surveyed and for Greensboro. The excluded category of restaurants includes all chain restaurants not specified (like Burger King), and all independent restaurants. Worker turnover is measured as the natural logarithm of the ratio of the number of new hires plus job leavers in the four weeks prior to the March survey, to the number of workers at the restaurant at the time of the March survey.

Table 2 gives the results of modeling the firms' response. Two different models look at explaining the maintenance of the wage structure—by granting an across the board percentage wage increases of 12%[9]—using the natural logarithm of the proportion of workers who earned below $4.25 in March (column 1), and the natural logarithm of the increase in wages necessary to raise all workers to at least $4.25 an hour (column 2.)[10]

There is little different in the results of the two models, except that wage increases at firms were significantly affected by the proportion of workers earning less than the new minimum wage, but not by the actual size of the wage gap. The data in Table 2 suggest that the high wage firms—those with few workers affected

by the change in the minimum wage —were less likely to grant across the board increases. So, it is not surprising that increases in the proportion of workers who had to have their wages raised are associated with increases in the extent to which the firm maintains its wage structure—giving workers not directly affected by the change in the minimum wage an increase (probability value of 0.0001.) A ten percent increase in the percentage of workers affected would increase the measure of maintaining the wage structure by 0.5 percent. Because the standard deviation of the natural logarithm of the percentage of workers affected equals 0.514, this is potentially a meaningful impact.

That the size of the actual wage gap was not significant, but the proportion of workers getting an increase was, suggests that the wage differentials are taken as fixed. So, firms must maintain the wage differentials for workers without respect to the size of those differentials. The difference in the significance between the number of workers effected and the size of their wage gap may also mean that firms believe worker morale is influenced more by how many workers receive wage increases than by the size of the increase per se. This difference may also occur because there is greater variance in the proportion of workers affected than in their wage differential with respect to $4.25.

A greater variance in the wage structure of the restaurant did decrease the extent to which the wage structure would be maintained (probability values from 0.02 to 0.0006.) This seems reasonable since greater wage dispersion may indicate that there are jobs in the firm for which the minimum wage is not the key wage. Some positions in the restaurant may be on a different wage contour. It may also follow that if the wage dispersion is large an increase in the wage for all workers in establishments with greater wage dispersion could prove more costly. And, the difference in wages may have made it less necessary to increase all workers wages to maintain worker moral. A ten percent higher variance in wages is associated with a 0.03 percent decrease in the measure of wage structure stability.

The turnover rate is not significant in any of the models, though variation in the turnover rate is greater than for most of the variables in the model. This is

an interesting finding. It gives even greater weight to the permanence of the wage structure. According to one view, the higher turnover rate in food service occupations should make the maintenance of a wage structure unnecessary—the firms could simply change the wage structure when new workers come into the firm. Another view is that firms may use dismissals as a way of maintaining work effort, and not wages. In this view, the effect of worker turnover would be reflected in job growth more than wage structure (Rebitzer and Taylor, 1991).

None of the dummy variables on the major chains is significant in predicting the extent to which across the board wage increases were made. And, a test of the joint hypothesis of their statistical significance also confirms that the firms did not differ. The results reported for the other variables is not affected when these dummy variables are deleted from the models. This would follow Eichner's contention that the internal wage structure of different firms in the same industry should be similar. Still, the Greensboro coefficient is negative and significant (probability values from 0.02 to 0.0001.) This suggests that Greensboro firms were less likely than the Jackson firms to maintain their wage structure. Katz and Krueger also found local effects to be important. The ratio of the actual wages paid in April to those that would have been paid if an across the board increase was granted was from 3 percent to 6 percent lower in Greensboro than Jackson.[11] So the difference is slight.

Table 3 shows the robustness of the relationship between the proportion of affected workers and the wage structure.[12] Here the dependent variable is taken to be the maintenance of the wage structure as measured by the change in average wages, and as measured by the change in the variance of wages within the firms. The independent variables included in the models shown in Table 3 are the same as those listed in Table 2. But, when the measure of wage structure is the ratio of the variance of wages within the firm in April to the variance of wages within in the firm in March, the within firm variance of wages in March is deleted from the independent variables. Table 3 also shows what happens when the sample is changed. The sample is changed to reflect only those firms from

Jackson, and those firms whose average wage increased by less than twelve percent. The Jackson sample is chosen because of the difference in the response rate between Jackson and Greensboro. Because firms were less likely to respond to the survey in Greensboro, the Jackson only sample helps to show whether potential selectivity bias among the Greensboro firms is driving the results. Firms that increased their average wage less than twelve percent are singled out to control for firms that granted wage increases by more than what was mandated by law. Those firms may have granted larger increases for reasons having nothing to do with the change in the minimum wage. In that sense, this would make those firms potential outliers. So, changes in the wage structure of those firms may be different.

The proportion of workers at a firm affected by the change in the minimum wage was statistically significant in predicting the extent to which firms maintained their wage structure in all of the models except two. For the Jackson sample, using the increase of the average wage as the measure of wage structure, the proportion of affected workers was not significant. And, using the change in the variance of wages within the firm, the proportion of affected workers was not significant among firms that granted less than a twelve percent increase in wages.

In Table 4 are results from adding additional control variables. In conducting the survey, the number of workers visible to the surveyor were counted as well as the number of those workers who were African-American and female. For some restaurants this would mean all workers on a particular shift, while for others this would be those not in the kitchen. This was not possible for all restaurants. Some, like Pizza Hut delivery kitchens, have no visible workers. So, including these two variables reduces the sample size. Neither the reduction in sample size, nor the inclusion of these variables changes the coefficients on the other variables. But, the natural logarithm of the variance in wages is no longer significant.

In Table 4, the proportion of workers who were African-American

significantly reduced the extent to which across the board raises were made (probability values of 0.09 to 0.01.)[13] The proportion of the workers who were female significantly reduced the extent to which across the board raises were given in the model using the proportion of affected workers (probability value of 0.07.) The size of the impact of the race and sex composition of the work force is roughly equal in all the models. A ten percent increase in the proportion of African-Americans or women in the firm's work force decreased the measures of maintaining the wage structure by 0.3 percent. The variance in the proportion of a work force that is African-American is greater than the variance in the proportion female. This may explain why race is significant in both models.

It is possible that these data indicate a type of discrimination. Firms with large proportions of African-Americans, or women, may think that maintaining their wage structure is not important. Those firms may use dismissal and not wages to encourage work effort. The higher unemployment rates of African-Americans and the lower wage structure faced by women, may make pursuing such a strategy easier than among white males. The discrimination could be more direct. For women and African Americans may be in a separate wage structure in the firm. So that changes in the minimum wage may effect their wage structure, but not that of whites or males.

If firms were more likely to use dismissal than wages to encourage work effort when large portions of their work force were African American or female, then an increase in the minimum wage could have the positive effect of changing the firms behavior toward African American and female employees. To the extent that African American or female workers are part of another wage structure within the firm, increasing the minimum wage must serve to close the gap between the earnings of those workers and that of whites or males.

Raising the minimum wage appears to increase the average wage of the firm by more than is mandated by the change in the minimum wage. This is consistent with the wage structure being fixed, and not easily changed. But, the policy that brought about the new minimum wage also created a subminimum

wage. The use of the subminimum wage, which could have been used to higher teenagers, also provides a test of the fixed nature of the wage structure and of wage norms.

Changes in Employment

This section looks at changes in employment level at the firm level, in response to changes in wages mandated by the minimum wage law. As stated earlier, the conventional wisdom is that there is an inverse relation between increasing the minimum wage and employment. For policy makers the relationship between the level of the minimum wage and employment is the central relationship. The previous section established that not all firms were affected by changes in the minimum wage. Several of the firms in this survey already paid more than the federal minimum wage to all employees. Those firms serve as a control group.

Still, wages may not be the key variable. Rebitzer and Taylor (1991) argue that if firms use dismissal to increase work effort, and the supervisory resources of the firm are fixed, that raising the minimum wage will have the effect of lowering the marginal cost of labor. This is because at the higher wage, from the worker's perspective, the cost of dismissal has increased. So, workers are less likely to engage in behaviors that would get them fired. Thus, it is possible to have the existing work force increase their work effort with less intense supervision. As a result, Rebitzer and Taylor argue that the firm can hire more workers even though the average cost of labor has increased. In this view, the turnover rate may be a better indicator, than wage changes, of whether the minimum wage is higher than the Rebitzer and Taylor "no-shirking" constraint. This is because we do not observe the cost of worker supervision. The turnover rate may be acting as a proxy. Firms with high turnover rates have wages that do not make the Rebitzer and Taylor "no-shirking" constraint binding--the firms must still use dismissals to increase work effort.

In this section, both propositions are tested. The effect of wage changes on employment, and the effect of turnover on employment. The results show labor

turnover is significant in predicting the firm's response to employment after the minimum wage changes, but that wage changes are not significant.

The change in employment at the firm--the dependent variable--is measured as the difference in the natural logarithm of employment in April 1991 compared to March 1991. To measure the employment effect, two measures of the impact of changing the minimum wage are used. Both only look at the change in wages mandated by law. First, following Katz and Krueger the wage gap is measured by the natural logarithm of the ratio of $4.25 times the number of employees earning below the minimum, to the actual wages of those earning below the new minimum in March.[14] This measures the number of workers below the new minimum, weighting them by the size of the gap between their wage and the new minimum. The workers who are above the new minimum wage are ignored by this measure. If the number of workers below the new minimum is small, then though they may receive a significant raise, the wages of the firm may increase only slightly. An alternate measure, to encompass the entire work force, is the natural logarithm of the ratio of the mean wage of the firm with the $4.25 minimum wage to the actual mean wage of the firm in March. In calculating the new average, it was assumed that only those workers who earned below $4.25 would receive a wage increase, and that they would be raised only to $4.25.[15] Later in this section, the question of the influence of the actual change in wages on employment will be addressed.

Besides the key independent variable--the change in the minimum wage--other variables measuring the wage structure of the firm, and its turnover rate are used to control for firm-specific characteristics. These other independent variables include: the natural logarithm of the variance in wages in March, the natural logarithm of the March turnover rate, and the natural logarithm of the coefficient of variation in March wages. The amount of wage dispersion measures the homogeneity of the work force. Greater heterogeneity in the firm could mean that workers are not viewed as perfect substitutes for each other. A high turnover rate may show a management style that emphasizes the use of dismissal to encourage work effort. Raising the minimum wage for such managers could

increase employment by lowering the marginal cost of supervision (Rebitzer and Taylor 1991). It also could allow firms to adjust to the higher minimum wage through attrition and avoid firing existing low productive workers.

The two measures of the effect of changing the minimum wage using the affected workers weighted by their wage, are used in the models that appear in Table 5. The two measures of the wage gap variable are negative, as the conventional theory would suggest. But, they are far from statistically significant. Katz and Krueger (1991b) found this coefficient to be positive and significant. However, they use changes in the starting wage, and not in the existing wage structure. So, mandated wage changes are not the key to understanding the effect of the 1991 change in the federal minimum wage on this set of employers. This may not be surprising. Economists are, of course, concerned with changes in real variables. But, changes in the minimum wage, and the level of the minimum wage are set in nominal terms. In real terms, the minimum wage declined by 40.5 percent between 1979 and March 1991 (using the CPI-UX1 as a deflator). The increase in the minimum wage from March to April still left the real value of the minimum wage 25.6 percent below its 1979 level. So, this may not have been a meaningful real wage change.

Table 6 shows the results of a two-stage least squares estimation of the change in employment using the natural logarithm of the change in the average wage (weighted by workers, not by hours worked) of workers from March to April--measured as the natural logarithm of the ratio of the mean wage in April to March. Additional instrumental variables included the size of the labor force in March, and the variation of wages in March. The previous section showed that wages increased by more than the mandated amount. To the extent that these wage increases were the result of the minimum wage change on wage structure, the full effect of changing the minimum wage may be better measured as the change in all workers' wages. In Table 6, the coefficient on the change in wages is positive but insignificant. In the first equation shown, the coefficient on March labor turnover rate is significant, and on the same order as in the previous

regressions. In the second equation, without the March labor turnover rate, the sign on the coefficient for wages remains positive but still not significant.

It is surprising that the coefficient on the turnover rate is positive and significant (probability value of 0.01 in Table 5 and 0.004 in Table 6.) A ten percent increase in the March turnover rate led to a 1.1 percent increase in April employment. This suggests that there may be something to the Rebitzer and Taylor argument.

Why Labor Turnover Rates Matter

But, it may also be the case that the way turnover is measured drives the results. The turnover rate includes a measure of new hires and quits. If quits are low, then this equation would be predicting the change in April employment based on lagged employment growth in March. To control for this possibility, the models

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There is a high correlation between quits and hires. Their multicollinearity could mean that including both in the same equation will reduce the significance of one of them. When the model is estimated with the quit measure, excluding the

new hire measure, quits are positive (coefficients ranging from 0.118 to 0.121) and significant (probability value of 0.02). The change in employment predicted by this coefficient is on the same order of magnitude as the turnover rate measure. Coefficients of the other variables essentially remain unchanged, except for the dummy variable for Greensboro, which becomes statistically insignificant. So, it would appear that the effects of the turnover rate measure reported in Tables 5 are not an artifact of its construction's inclusion of new hires.

High turnover rates may imply that firms use dismissal as a way of eliciting work effort, as in the Rebitzer and Taylor model. Another possibility is that after the minimum wage increased, quits declined. Firms with higher turnover rates may have continued to hire workers at a rate set for higher quit rates. So, those firms would appear to have greater employment growth until they adjusted to the lower quit rates. Table 8 presents the results of using the same variables used to model employment growth to explain changes in quit and new hire rates. Employment growth is now decomposed into its separate elements, the change in new hires and the change in quits:[16] each estimated separately. The dependent variables are the change in the natural logarithms of the new hire rate (new hires divided by existing workers) from March to April, and the change in the natural logarithms of quit rates (quits divided by existing workers.) Once again, changes in the mandated minimum wage are not significant. The mandated wage increase is not statistically significant in predicting either the change in the hiring rate or the quit rate.

The March turnover rate, however, is significant in predicting both the change in the new hire rate, and in the quit rate. Firms with high turnover rates lowered the rate at which they hired new workers after the change in the minimum wage (probability value of the coefficient is 0.0001.) A ten percent higher March labor turnover rate lowered the change in the new hire rate by 8.6 percent. In a separate breakdown of the turnover rate, the March new hire rate significantly predicts (probability value of 0.0001) the change in the new hire rate from March to April--the March quit rate does not. Firms with a higher turnover

rate in March also tended to have lower changes in their quit rates from March to April (probability value of the coefficient is 0.0003.) A ten percent higher March labor turnover rate lowered the change in the quit rate by 9.1 percent. In a separate breakdown of the turnover rate, the March quit rate significantly predicts (probability value 0.0001) the change in the quit rate from March to April--the March new hire rate does not.

This data leaves two possibilities. First, is that firms that used dismissals as a motivating factor before the increase in the minimum wage changed behaviors. Because firms with higher March turnover rates significantly lowered their new hiring rate, it does not appear that their net increase in employment was an accidental artifact.

The second possibility is that the decomposition of the individual components amounts to predicting current turnover rates using lagged turnover rates. This possibility arises because the individual components of the turnover rate are significant in predicting the separate components of employment growth. But, this second possibility appears the least likely explanation. The March quit rate is not a significant predictor of the April quit rate (probability value 0.25) or the April new hire rate (probability value 0.91), nor is the March new hire rate a significant predictor of the April new hire rate (probability value 0.66.)

So, as happens for Katz and Krueger (1991b), these data do not support the conventional wisdom. Controlling for labor turnover rates, the April 1991 increase in the minimum wage did not significantly impact employment levels at restaurants in Greensboro or Jackson. The importance of the turnover rate, and the lack of significance of the mandated wage changes gives support for the theory that Rebitzer and Taylor put forth.

Nonwage Responses to Change in the Minimum Wage

It is possible that the response of the firms did not show in employment levels. Firms could respond to changes in the minimum wage by changing other forms of compensation, or making changes in working conditions.[17] Table 9 presents the results of a set of questions put to the firms about compensation and

working conditions. Firms are divided between those that were paying any worker $3.80 or below in March, and those for whom the old minimum wage was not binding.

Most firms did not change major policies. Ninety-one percent of firms changed neither the time to the first wage increase, nor the amount of the first wage increase for their workers. Two percent changed the amount, but not the timing of the increase, while two and one-half percent changed the timing, but not the amount. The remaining firms changed both.

Some firms with a higher pay scale did change the implicit contract under which their workers labored. Fewer changes were made by those firms where the minimum wage was binding. For instance, the amount of time to the first raise was changed by eighteen percent of the high wage firms and none of the lower wage firms. Similarly, the time to the first raise increased in eight percent of the high wage establishments, but in only three percent of the lower wage restaurants. Neither of these differences between the two sets of establishments is statistically significant, however. Roughly two percent of the high wage firms reported reducing fringe benefits, as opposed to none of the lower wage firms. This was a statistically significant difference (probability value of 0.08.)

Another response of firms could be to reorganize work. This could be done by decreasing the number of employees per shift (making workers work harder), or decreasing the number of shifts per day (making workers work longer.) Most firms changed neither--ninety-eight percent. One percent of all firms decreased the number of employees per shift, but did not change the number of shifts per day. The remaining one percent of firms decreased both.

Among the high wage firms, two percent reported reducing the number of employees per shift, as opposed to three percent of the lower wage firms. Almost one percent of the higher wage restaurants responded that they reduced the number of shifts per day, while three percent of the lower wage firms reported the same strategy. Neither of these differences between the high and low wage firms was statistically significant.

So, it would appear that changes in wages did not significantly change employment levels. And, very few firms made changes in compensation to balance changes caused by the mandated wage increase. The effect of the minimum wage change seems to have shown itself more in changes to wages and employment levels, and labor turnover rates were important than wage changes in predicting changes in employment levels.

Price Responses to Changes in the Minimum Wage

If employers do not respond to changes in the minimum wage by reducing employment levels, then conventional wisdom would suggest that firms would respond by raising prices. The March and April surveys included a price survey as well. The price of eight items was chosen for each restaurant. Generally, the items were chosen to cover the spectrum of the restaurant's menu. Table 10 shows the results of estimating the change in price levels. Included were all those restaurants for whom complete price and labor data was available. (See Appendix B for the price surveys that were used.)

Some initial price surveys taken by the students at Jackson State, were taken after April 1. Estimates of the effect of the wage change on these restaurants are listed in a separate regression labeled LATE, in Table 10, or by a dummy variable indicating late data. Not surprisingly, the price change for the late data is lower than for the timely data. Yet, the difference is not statistically significant.

The estimates in Table 10 were made using two-stage least squares. The change in the mean wage of workers at each firm was considered endogenous. Additional instrumental variables included the natural logarithm of the proportion of workers below the minimum, and the natural logarithm of the wage gap of those workers (as defined earlier.) Five separate regressions were run: One for the subsample where price data was collected after the increase in the minimum, and another for the subsample of timely data; another set for the subsample of firms in Jackson, and for Greensboro; and, a pooled regression of the complete sample. Two Chow tests were performed to see whether there were significant

differences between the late and timely sample, and the Jackson and Greensboro sample. For the difference between the two cities, the Chow test rejects that the two samples yield the same regression results.

In the pooled regression, the only coefficient that is statistically significant is the one for the number of days between the two surveys (probability value of 0.05.) This suggests that the changes in price were general price movements along a trend; not price changes reflective of changes in the minimum wage. The rate of fall is dramatic. A one percent increase in the number of days leads to a 0.15% decrease in price. The same coefficient was negative in all the regressions, except Greensboro. For the late surveys, and the subsample for Jackson, the coefficient was negative and significant (probability value of 0.07 for both.)

On the other hand, in the pooled regression, the coefficient on the change in the mean of the firm's wage is negative, though it was far from significant. The coefficient was positive and significant (probability value of 0.10) among the 22 firms in Jackson, where the price data was gathered after the increase in the minimum wage. The sign, and the magnitude, are as conventional theory would suggest. A one percent increase in wages led to a 2.5% percent increase in prices. The coefficient is not statistically different from one, so it is not possible to reject the hypothesis that an increase in wages leads to a proportionate increase in prices. However, for the 53 firms where the data on prices were collected before, and after, the change in the minimum wage, the coefficient on the change in wages is negative--though not significant. In the subsample for Jackson, and for Greensboro, the coefficient on wages is positive, though not significant.

In both the Jackson and Greensboro subsamples, the coefficient for the March turnover rate was significant, though the sign was opposite (probability values of 0.07 and 0.05.) In Greensboro, firms with high labor turnover increased their prices slightly. A one percent increase in labor turnover led to a 0.05% increase in prices. While in Jackson, a one percent increase in labor turnover led to a 0.09% decrease in prices. The Jackson data are consistent with increases in the wage, decreasing the marginal cost of supervision. Differences in the two

labor markets may account for differences in the cost of turnover. In a market with high unemployment, or underemployment, a high turnover rate is less costly than in a market that is tighter. So, the difference here may reflect the lower unemployment rate in Greensboro discussed earlier--evidence that the Greensboro labor market was tighter than the Jackson market.

The number of workers in March, was used to control for the size of the restaurant. The within firm variance of March wages was used to control for the differences in employee skills. This was also a way to measure differences in the type of restaurant. The coefficient on the size of the firm, measured by the number of workers, was not significant in any of the regressions. The within firm variance in wages was positive and significant in the Jackson sample (probability value of 0.02.) A one percent increase in the variance of the firm's wages led to a 0.07% increase in prices. These coefficients appear to have captured all the differences in the restaurants. Only the coefficient on Wendy's, in the regression for the subsample of timely price surveys, was statistically significant (probability value of 0.02.) Among restaurants with timely surveys, Wendy's restaurants increased prices 19.5% relative to the non-chain restaurants.

The time of day of the visit was included to control for whether the restaurant might change prices between breakfast and lunch, or lunch and dinner. In both the Jackson and Greensboro regressions, the coefficient on the time of day that the March survey was conducted was statistically significant (probability values of 0.08 and 0.05.) The signs, however, were reversed. In Greensboro, the coefficient on the time of the April visit was significant (probability value of 0.08,) though in Jackson it was not. In the pooled regression the sign on neither coefficient was significant.

Restaurants in Jackson and Greensboro had very different responses in price levels from March to April. Still, in neither city, nor in the pooled regression, was the coefficient on the change in mean wages statistically significant. In both the subsample for Jackson and Greensboro, the coefficient was positive as conventional wisdom would predict. But, in the pooled regression,

the coefficient was negative. So, on balance, the minimum wage did not increase prices.

The Use of the Youth Subminimum

Finally, the ostensibly negative effect of the minimum wage on teenage employment led to a compromise in the most recent legislation that allows teenagers to be paid a wage below the minimum. Yet, Katz and Krueger (1991a, 1992) found very little use of the subminimum by fast food restaurants in Texas. They did, however, find that use of the subminimum increased from 1990 to 1991. Table 11 shows the results of three of the questions put to restaurants in Jackson and Greensboro. These are the same questions used by Katz and Krueger to discuss the use of the subminimum.

Use of the subminimum wage by firms gives a direct test of whether the minimum wage—as the key wage for food service workers—is also the wage norm. If firms accept the minimum wage as a wage norm, then firms could not pay one set of workers a lower starting wage for performing the same task as the minimum wage workers. To do so would imply maintaining the workers in a different job cluster so that their wage structure could remain below the minimum wage workers; or, it would require giving the subminimum wage workers a bigger wage increase than the minimum wage workers, at some point, so that both workers could be in the same wage structure. Either choice implies a dual wage structure.

Surprisingly, in this survey, use of the subminimum wage declined after April 1, 1991; though only a small minority of firms—five out of a matched sample of 199—used the subminimum in March. Table 11 shows a great degree of consistency in firms' explaining why they did not use the subminimum. Of the 147 firms in the matched sample, 62 (those along the diagonal) gave the same answer in both April and March. Though there appears to have been a learning curve effect. There is a big increase in the number of firms (three in March to ten in April) that reported they felt the subminimum wage law was too difficult to apply. Eight of the ten firms that thought, in April, that they law was too difficult

to apply either did not know about the law in March or gave an unspecified answer in March. And, there was a big decline (59 firms in March to 39 in April) that gave unspecified reasons for not using the subminimum wage. The big change among firms that gave unspecified explanations in March is among firms that believed in April that it was unfair to pay different wages. A potential reason for this is that more managers in April than in March answered that they felt more certain that it was unfair to pay different wages for similar work.

Also in April, more managers thought that they could not attract qualified teenage workers at the subminimum. In March 42 firms thought they could find qualified teenage workers at the subminimum wage. But, in April, a majority of those firms (29) switched views and reported that they no longer believed that they could find qualified teenagers at the subminimum wage. Of the 110 firms that said in March they could not find qualified teenagers at the subminimum wage, only 19 changed their view in April. This pattern of change in managers' attitudes is consistent with a view that there is an internal wage structure; and, that it cannot be changed easily. The April subminimum was lower in absolute and relative terms with relation to the minimum in March.

Another interesting result is that the number of restaurants that did not use the subminimum because they did not hire teenagers decreased from March to April. With the rise in the minimum, one view would have had the firms substituting older workers for younger less productive workers—or substituting subminimum wage teenagers for minimum wage adults. Yet, neither position is consistent with these sets of numbers.

It is also interesting that the number of managers who said that they did not use the subminimum because they did not know about the law remained almost constant in both March and April. This is also a finding similar to Katz and Krueger. Half (15 firms) of those in April who said they did not know about the law had also given that answer in March. Another twenty percent (6 firms) of those who did not know about the law in April, had given an unspecified answer in March. And, another twenty percent (6 firms) did not employ teenagers in

March, and so may have been unaware of the law because they did not hire any workers eligible for the subminimum wage. This leaves the ten percent (3 firms) of firms in April who claimed not to know about the law as giving a potentially inconsistent answer.

Conclusions

With the findings of Katz and Krueger, some bold new conclusions come from this analysis. First, firms do try to maintain their wage hierarchy. Wages increased by more than what was mandated by the change in the minimum wage. This was most pronounced among those firms with the largest number of workers required to receive a raise. Second, employment levels of firms did not decline significantly because of increases in wages. Firms with the highest turnover rates in the month prior to the minimum wage increase were the firms most likely to increase their work force in April. Third, while prices did increase with wages for some restaurants in Jackson, they did not do so in Greensboro nor in the sample as a whole. Thus, conclusions about the way that the minimum wage change affected prices must remain tentative. Local product and labor market effects may still matter, and generalizations may be difficult. Katz and Krueger found weak support that prices fell as wages increased.

It would appear that too much has been made of the minimum wage's negative effects. Perhaps, this was already known by those hiring minimum wage workers with the greatest frequency--food service managers. Allowed to pay a subminimum wage, extremely few in this sample chose to do so. In fact, in the April survey, none of the firms paid the subminimum wage to teenagers. Further, if the wage mattered in employment levels, then firms with high turnover rates should have reduced employment--but, they significantly increased employment.

This was a study of low wage workers in low wage areas. If the federal minimum wage was binding, this study should have seen evidence of it. Still, like Katz and Krueger, little of the important changes in employment, working conditions or price could be traced to changes in the minimum wage.

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Notes

1. See Brown (1988) for a good review on economists' thinking.

2. Using the a full year of data from the outgoing-rotation-groups of the Current Population Survey (the wage and earning file) for 1989, the author's calculations for hourly workers are that 4.2 percent nationally and in North Carolina were paid the minimum wage or less, and 10.8 percent of Mississippi workers were paid the minimum wage or less. The smaller sample size for Mississippi places a greater standard error on the 10.8 percent number. The Bureau of Labor Statistics does not publish a number for Mississippi.

3. The colleges in Greensboro include Bennett, Greensboro and Guilford as well as the University of North Carolina--Greensboro and North Carolina Agricultural and Technical State University. Total full-time student population is 15,520.

4. The initial phase of the survey was conducted by telephone. All restaurants in Greensboro listed in the Greensboro Yellow-Pages were used as the sample frame. The vast majority of the restaurants would not respond to the telephone survey.

5. Of the remaining 117 restaurants, incomplete responses or non-responses were obtained as follows: 31 disconnected telephone numbers; 40 not interested in participating in survey; 12 referred questions to their district office; and, 34 could not be completed in time.

6. See Mincy 1990 as an example.

7. Wages were recorded in intervals. So, the means and variances that are calculated use the midpoints of the wage intervals. For the upper wage interval, the midpoint was calculated as half of the upper wage limit and the highest reported wage at the establishment. Some of the establishments were restaurants with waitpersons. These workers are allowed to be paid below the minimum--with tips assumed to make up the difference. All workers below the minimum were therefore treated as if they earned the minimum.

8. In models 1 and 2 the measure is:

$$E = \log\left(\frac{(\sum_{i=1}^{k} W_i^{April} \cdot n_i^{April}) \,/\, N^{April}}{[\sum_{i=1}^{k} (W_i^{March} \cdot 1.11842) \cdot n_i^{March}] \,/\, N^{March}}\right)$$

The model was also estimated using an across the board $0.45 wage increase. The results do not change.

9. The results are the same whether the measure is a flat increase of $0.45 per worker. Table 1 showed that some mixture of the three scenarios was followed by the firms. The chose of scenario 2 or 3 is arbitrary.

10. This is equal to:

$$G = \frac{\sum_{i=1}^{j} 4.25 \cdot n_i^{March}}{\sum_{i=1}^{j} W_i^{March} \cdot n_i^{March}}$$

$$Where\ W_j = 4.25$$

11. In Table 3 the coefficient for Greensboro in models 1 and 2 are roughly -0.03, and in models 4 and 5 they are roughly -0.06. The effect is measured as [exp(β) - 1]*100, where β is the regression coefficient.

12. The wage gap result was not significant, or consistent in sign across the models shown in Table 3.

13. This result also is robust across the various models and samples used to show the consistency of the results for the proportion of affected workers in Table 3.

14. This is expressed as in note 6.

15. This is given as:

$$E = \frac{4.25 \cdot N_j + \left(\sum_{i=j+1}^{k} W_i^{March} \cdot n_i^{March}\right)}{\sum_{i=1}^{k} W_i^{March} \cdot n_i^{March}}$$

$$Where\ N_j \equiv \sum_{i=1}^{j} n_i^{March}$$

$$and\ W_j = 4.25$$

Equations were also estimated using the proportion of workers who were below the minimum wage. Using this variable as a measure of the impact of the minimum wage did not change the results.

16. More accurately, these are not quits. These are workers who were dismissed or quit in the previous four weeks.

17. Another possibility is for firms to switch the composition of their work force. The change could be from teenage to adult, or an increase in full-time and a decrease in part-time workers. Unfortunately, the questionnaire design provides only anecdotal evidence on the teenage composition. This is discussed in the section on the use of the Youth Subminimum. There was very little change in the mean percentage of part-time workers. For the average restaurant, the percentage of part-time workers changed from 68.4 percent in March to 69.4 percent in April. This small change leaves very little to be explained, and attempts to model the change led to insignificant results.

Table 1
Wage Structure of Firms
Before and After Change in Minimum Wage

	Mean	*Between Variation*	*Within Variation*
March	$4.30	5.947	0.188
Scenario One (Raise to $4.25 only)	$4.49	4.140	0.149
Scenario Two (Across the board $0.45 raise)	$4.75	5.947	0.188
Scenario Three (Across the board 12% raise)	$4.80	6.439	0.199
April	$4.63	2.503	0.191

Table 2
Ordinary Least Squares Results
Explaining Wage Structure Maintenance
(standard errors in parentheses)

Means* (*Standard Errors*)	*Dependent variable (in log Form):*	*April wage/ Uniform 12% wage increase (1)*	*April wage/ Uniform 12% wage increase (2)*
Dependent			
0.973			
(0.005)	*Explanatory variables*		
	Intercept	-0.048	-0.034
		(0.030)	(0.035)
	Continuous variables (in log Form):		
0.714	Proportion of Workers Affected	0.050	
(0.026)		(0.012)	
1.071	Wage Gap of Workers below		-0.041
(0.002)	$4.25		(0.244)
20.757	Number of March Workers	0.020	0.008
(1.159)		(0.011)	(0.012)
0.106	Within Firm Variance of	-0.003	-0.005
(0.022)	March Wages	(0.001)	(0.001)
0.280	March Labor Turnover Rate	0.008	0.005
(0.026)		(0.009)	(0.009)
Proportions	*Dichotomous variables:*		
0.028	McDonald's Restaurant	-0.035	-0.014
		(0.029)	(0.031)
0.056	Wendy's Restaurant	-0.024	-0.009
		(0.023)	(0.025)
0.044	Kentucky Fried Chicken	-0.022	0.000
	Restaurant	(0.026)	(0.027)
0.033	Arby's Restaurant	0.017	-0.005
		(0.034)	(0.037)
0.033	Pizza Hut Restaurant	-0.043	-0.038
		(0.027)	(0.029)
0.044	Hardees Restaurant	0.013	0.048
		(0.029)	(0.031)
0.402	Greensboro, NC	-0.036	-0.064
		(0.015)	(0.015)
	R^2	0.403	0.296
	Root Mean Square Error	0.057	0.062
189	**Number of Observations**	103	103

*These are means of the variables, not the means of their logarithms.

Table 3
Ordinary Least Squares Results
Showing Effect of the Proportion of Workers Affected
By Change in Minimum Wage on Wage Structure

Dependent Variable (in log Form):	*Proportion of workers affected*					
	Coefficient	*Std. Error*	*Prob. Value*	R^2	*Root Mean Squre Error*	*N*
*April wage/ Uniform 12% wage increase**						
Full sample	0.050	0.012	0.0001	0.403	0.057	102
Jackson only	0.023	0.024	0.3419	0.241	0.50	68
Wage increase less than 12%	0.022	0.10	0.0320	0.543	0.041	70
*April wage variance/ March variance***						
Full sample	2.718	1.014	0.009	0.138	4.672	93
Jackson only	2.014	0.743	0.009	0.146	1.646	65
Wage increase less than 12%	0.086	0.359	0.813	0.092	1.433	62

The probability value is for a two-tailed t-test of the hypothesis that the coefficient is zero.
*Other independent variables are those shown in Table 2.
**Other independent variables are those shown in Table 2 except the within firm variance of March wages is deleted.

Table 4
Ordinary Least Squares Results
Explaining Wage Structure Maintenance
With Race and Sex Composition of the Work Force
(standard errors in parentheses)

Dependent Variable in (log Form):	*April Wage/ Uniform 12% Wage Increase*	
Explanatory Variables		
Intercept	-0.077	-0.093
	(0.051)	(0.062)
Continuous variables (in log form):		
Proportion of Workers Affected	0.046	
	(0.013)	
Wage Gap of Workers below $4.25		0.118
		(0.296)
Number of March Workers	0.016	0.006
	(0.015)	(0.016)
Within Firm Variance of March Wages	-0.006	-0.012
	(0.006)	(0.006)
March Labor Turnover Rate	0.008	0.000
	(0.009)	(0.010)
Proportion African-American Workers	-0.029	-0.020
	(0.011)	(0.012)
Proportion Female Workers	-0.028	-0.025
	(0.015)	(0.017)
Dichotomous variables:		
McDonald's Restaurant	-0.034	-0.023
	(0.026)	(0.028)
Wendy's Restaurant	-0.012	-0.002
	(0.019)	(0.021)
Kentucky Fried Chicken Restaurant	-0.018	-0.003
	(0.022)	(0.024)
Arby's Restaurant	0.031	0.006
	(0.028)	(0.031)
Pizza Hut Restaurant	-0.034	-0.031
	(0.022)	0.024
Hardees Restaurant	-0.001	0.034
	(0.025)	(0.026)
Greensboro, NC	-0.031	-0.050
	(0.017)	(0.021)
R^2	0.531	0.420
Root Mean Square Error	0.044	0.049
Number of Observations	71	71

Table 5

Dependent Variable (in log Form): Change in Employment (March to April)					
Intercept	0.080	0.058	0.075	0.063	0.071
	(0.117)	(0.118)	(0.119)	(0.119)	(0.121)
Wage Gap of Workers below $4.25	-0.367		-0.418		-0.414
	(1.273)		(1.287)		(1.287)
Change in Mean Wage (Raise only to those below $4.25)		-0.056		-0.290	
		(1.403)		(1.551)	
Within Firm Variance of March Wages			-0.003	-0.003	
			(0.007)	(0.008)	
Coefficient of Variation of March Wages					-0.002
					(0.007)
March Labor Turnover Rate	0.113	0.114	0.113	0.115	0.113
	(0.046)	(0.045)	(0.046)	(0.046)	(0.046)
McDonald's Restaurant	0.137	0.138	0.135	0.138	0.135
	(0.541)	(0.155)	(0.155)	(0.156)	(0.155)
Wendy's Restaurant	0.051	0.053	0.052	0.054	0.052
	(0.125)	(0.125)	(0.126)	(0.126)	(0.126)
Kentucky Fried Chicken Restaurant	-0.059	-0.060	-0.057	-0.056	-0.057
	(0.142)	(0.143)	(0.143)	(0.144)	(0.143)
Arby's Restaurant	0.191	0.196	0.193	0.198	0.193
	(0.195)	(0.195)	(0.197)	(0.196)	(0.197)
Pizza Hut Restaurant	-0.028	-0.029	-0.025	-0.025	-0.025
	(0.153)	(0.153)	(0.154)	(0.154)	(0.154)
Hardees Restaurant	-0.042	-0.032	-0.042	-0.033	-0.015
	0.161	(0.158)	(0.162)	(0.158)	(0.162)
Greensboro, NC	0.130	0.135	0.129	0.128	0.129
	(0.077)	(0.084)	(0.077)	(0.086)	(0.077)
R^2	0.097	0.096	0.098	0.097	0.098
Root Mean Square Error	0.328	0.328	0.330	0.330	0.330
Number of Observations	103	103	103	103	103

Table 6

Dependent Variable (in log form): Change in Employment (March to April)		
Intercept	-0.186	-0.407
	(0.215)	(0.212)
log(Change in Mean Wage March to April)	2.383	2.708
	(1.782)	(1.871)
March Labor Turnover Rate	0.133	
	(0.045)	
McDonald's Restaurant	0.148	0.168
	(0.161)	(0.169)
Wendy's Restaurant	0.035	0.046
	(0.123)	(0.129)
Kentucky Fried Chicken Restaurant	-0.052	0.028
	(0.148)	(0.153)
Arby's Restaurant	0.406	0.419
	(0.163)	(0.171)
Pizza Hut Restaurant	0.097	0.170
	(0.179)	(0.187)
Hardees Restaurant	-0.048	-0.011
	(0.159)	(0.167)
Greensboro, NC	0.243	0.223
	(0.137)	(0.144)
R^2	0.169	0.072
Root Mean Square Error	0.059	0.060
Number of Observations	110	110

Estimated using two-stage least squares. Change in the mean wage was treated as endogenous. Additional instrumental variables included the size of the labor force in March and the within firm variance of March wages.
Standard errors in parentheses.

Table 7

Dependent Variable (in log Form): Change in Employment (March to April)					
Intercept	0.442	0.414	0.441	0.421	0.438
	(0.172)	(0.170)	(0.173)	(0.173)	(0.175)
Wage Gap of Workers below $4.25	-0.796		-0.835		-0.830
	(1.608)		(1.630)		(1.629)
Change in Mean Wage (Raise only to those below $4.25)		-0.397		-0.595	
		(1.665)		(1.833)	
Within Firm Variance of March Wages			-0.002	-0.003	
			(0.010)	(0.011)	
Coefficient of Variation of March Wages					-0.002
					(0.011)
Proportion of March Workers who were New	0.204	0.207	0.204	0.209	0.204
	(0.067)	(0.067)	(0.067)	(0.068)	(0.067)
Proportion of March Workers who Quit	0.056	0.057	0.056	0.058	0.057
	(0.055)	(0.055)	(0.055)	(0.056)	(0.055)
F-test that Coefficient on Quits=New Hires	1.998	2.058	1.963	2.049	1.964
Probability value	0.16	0.16	0.17	0.16	0.17
F-test that average of Coefficients on Quits + New Hires=Coefficient on Turnover	0.284	0.311	0.309	0.318	0.306
Probability value	0.60	0.58	0.58	0.57	0.58
Significance of Restaurant dummies	No	No	No	No	No
Significance for Greensboro, NC dummy	No	No	No	No	No
R^2	0.228	0.226	0.229	0.227	0.229
Root Mean Square Error	0.331	0.332	0.334	0.334	0.334
Number of Observations	81	81	81	81	81

Standard errors are in parentheses.

Table 8

Dependent Variable	Change in Log New Hires	Change in Log Quits
Intercept	-1.106	-0.827
	(0.758)	(0.871)
Wage Gap of workers below $4.25	1.800	0.137
	(4.558)	(5.237)
March Labor Turnover Rate	-0.855	-0.909
	(0.200)	(0.230)
Coefficient of Variation of March Wages	0.007	0.045
	(0.109)	(0.125)
McDonald's Restaurant	-1.272	0.241
	(0.468)	(0.537)
Wendy's Restaurant	-0.233	0.087
	(0.374)	(0.430)
Kentucky Fried Chicken Restaurant	-0.230	-0.463
	(0.463)	(0.532)
Arby's Restaurant	-1.431	-0.351
	(0.595)	(0.683)
Pizza Hut Restaurant	-0.256	0.044
	(0.477)	(0.548)
Hardees Restaurant	-0.359	0.447
	(0.437)	(0.503)
Greensboro, NC	0.318	0.321
	(0.353)	(0.406)
R^2	0.428	0.338
Root Mean Square Error	0.758	0.871
Number of Observations	52	52

Standard errors are in parentheses.

Table 9

Question:	All workers above $3.80		Some workers at $3.80		T
	Pct.	N	Pct.	N	
Did amount of first raise change?	18.52%	162	0.00%	36	1.645
	(0.113)		0.000		
Did time to first raise change?	8.07%	161	2.78%	36	1.507
	(0.022)		(0.028)		
Did you reduce fringe benefits?	1.84%	163	0.00%	37	1.743
	(0.011)		0.000		
Decreased employees per shift?	1.84%	163	2.70%	37	0.337
	(0.011)		(0.027)		
Decreased shifts per day?	0.61%	164	2.70%	37	0.755
	(0.006)		(0.027)		

T statistic is for t-test assuming unequal variances in the two groups, except employees per shift which assumes equal variance.
Standard errors of the sample proportions are given in parentheses.

Table 10

Dependent Variable (in log Form): Change in Total Price of Eight Items	Late	Timely	Jackson	Greensboro	Pooled
Intercept	2.392	2.094	0.722	-0.432	0.703
	(5.134)	(1.948)	(2.567)	(4.345)	(1.348)
Change in Mean Wage (March to April)	2.526	-0.554	1.697	0.188	-0.279
	(1.341)	(0.744)	(1.344)	(0.742)	(0.839)
Number of Workers (in March)	0.094	-0.047	-0.012	-0.049	0.014
	(0.175)	(0.042)	(0.073)	(0.035)	(0.035)
Within Firm Variance of March Wages	0.041	-0.004	0.073	0.001	-0.001
	(0.071)	(0.006)	(0.031)	(0.004)	(0.006)
March Labor Turnover Rate	-0.026	0.033	-0.086	0.050	0.002
	(0.075)	(0.031)	(0.045)	(0.024)	(0.028)
Days Between March and April Survey	-0.304	-0.035	-0.169	0.390	-0.150
	(0.145)	(0.142)	(0.090)	(0.466)	(0.075)
Day of March Visit	-0.565	-0.552	-0.006	-0.288	-0.061
	(1.587)	(0.484)	(0.775)	(0.784)	(0.370)
Time of Day of March Visit	0.007	-0.002	-0.013	0.028	-0.005
	(0.029)	(0.007)	(0.007)	(0.009)	(0.006)
Time of Day of April Visit	0.006	0.006	0.008	-0.017	0.004
	(0.017)	(0.007)	(0.008)	(0.009)	(0.006)
Late Data			-0.057		-0.027
			(0.162)		(0.087)
McDonald's Restaurant	-0.128	0.071	0.005		0.000
	(0.442)	(0.096)	(0.110)		(0.006)
Wendy's Restaurant	-0:111	0.178	0.029		0.051
	(0.140)	(0.077)	(0.075)		(0.061)
Kentucky Fried Chicken Restaurant	-0.181	-0.010	-0.112		-0.107
	(0.125)	(0.151)	(0.091)		(0.082)
Arby's Restaurant		-0.016		-0.021	0.043
		(0.143)		(0.092)	(0.149)
Pizza Hut Restaurant	0.087	-0.051	-0.043	-0.011	-0.015
	(0.222)	(0.086)	(0.098)	(0.100)	(0.073)
Hardees Restaurant	-0.135	0.059	-0.094	-0.027	0.045
	(0.179)	(0.105)	(0.158)	(0.116)	(0.096)
Greensboro, NC		-0.068			-0.027
		(0.076)			(0.087)
R^2	0.690	0.182	0.311	0.681	0.120
Root Mean Square Error	0.140	0.127	0.144	0.068	0.138
Number of Observations	22	53	49	26	75
Chow Test F-Statistic$_{(14,45)\|(110,48)}$		1.605		2.048	
Probability Value		0.119		0.048	

Estimated using two-stage least squares. Change in the mean wage was treated as endogenous.
Additional instrumental variables included the log of the proportion of workers below the new minimum, and the log of the wage gap of those workers (defined as before).
Standard errors are in parentheses.

Table 11
Use of the Subminimum Wage for Youth

Did you pay any workers the training wage?

In March \ *In April*	*Yes*	*No*	*March Totals*
Yes	0	5	5
			2.5%
No	0	194	194
			97.5%
April Totals	0	199	
	0.0%	100.0%	

If, No, Why not?

	In March \ *In April*	*(A)*	*(B)*	*(C)*	*(D)*	*(E)*	*March Totals*
(A)	*Did not know about the law*	15	3	7	2	7	34
							23.1%
(B)	*Too difficult to apply the law*	0	1	1	1	0	3
							2.0%
(C)	*Believe it unfair to pay different wages*	3	1	20	3	7	34
							23.1%
(D)	*Do not employ teenagers*	6	0	4	4	3	17
							11.6%
(E)	*Other*	6	5	24	2	22	59
							40.1%
	April Totals	30	10	56	12	39	
		20.4%	6.8%	38.1%	8.2%	26.5%	

Table 11 cont'd

Can qualified teens be found at the subminimum wage?

In March	*In April*		*March Totals*
	Yes	*No*	
Yes	13	29	42
			27.6%
No	19	91	110
			72.4%
April Totals	32	120	
	21.0%	79.0%	