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A Living Wage?
The Effects of the Minimum Wage on the Distribution of Wages, the Distribution of Family Earnings, and Poverty

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ABSTRACT

This paper analyses the distributional impact of the 1990 and 1991 increases in the federal minimum wage. The rise in the federal minimum wage had very different impacts across states, depending on state-specific minimum wage floors and the overall level of wages in each state. In states with a higher fraction of workers affected by the minimum wage change, we find that the minimum wage hike generated significant increases in the lower percentiles of wages, and significant reductions in wage dispersion. The higher minimum wage also led to increases in the lower percentiles of the family earnings distribution, and a narrowing of the dispersion in family earnings. We find some evidence that the increase in the minimum wage lowered poverty rates for families with some attachment to the labor market.

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Although most economic research on the minimum wage focusses on issues of efficiency, it has long been recognized that a binding minimum wage has potential distributional consequences as well.[1] In the conventional model of the labor market, a higher minimum wage creates efficiency losses by forcing employers to lay off less-productive workers. Contrary to this prediction, a series of recent papers (Katz and Krueger (1992), Card (1992a, 1992b), Machin and Manning (1994), Card and Krueger (1994)) finds that modest increases in the minimum wage have little or no effect on employment. Even the results in the earlier literature, however, suggest that the efficiency costs of a moderate increase in the minimum wage are small.[2] On the basis of these findings, one might conclude that the minimum wage is mainly a distributional issue -- at least in the range of the current U.S. minimum.

This paper analyzes the distributional impact of the wage increases generated by a rise in the minimum wage. We focus in particular on the most recent round of increases in the federal minimum wage, which boosted the minimum wage from $3.35 per hour to $3.80 per hour on April 1, 1990, and to $4.25 per hour on April 1, 1991. The key feature of our analysis is the recognition that these increases had very different impacts across states, depending on state-specific minimum wage rates and the overall level of wages in each state. The dramatic geographic variation in the "bite" of the recent federal minimum wage increases allows us to measure the effects of the minimum

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[1]See for example Stigler (1946), Gramlich (1976), and Horrigan and Mincy (1992).

[2]For example, the widely-cited review of the time-series evidence on teenage employment effects of the minimum wage by Brown, Gilroy, and Kohen (1982) concluded that a 10 percent increase in the minimum wage leads to a 1-3 percent (i.e. 0.5 to 1.5 percentage point) reduction in teenage employment, with negligible effects on older workers. Brown, Gilroy and Kohen argued that the lower end of this range was more likely -- a prediction that is born out by more recent time series studies, including Solon (1985), Wellington (1986), and Klerman (1992).

wage on the distribution of wages, the distribution of family earnings, and poverty rates, rather than merely simulating its effect, as has been done in much of the previous literature.[3]

We begin with a descriptive analysis of workers who are affected by a rise in the minimum wage. A widely-held stereotype is that minimum wage earners are teenagers from middle-class families who work after school for discretionary income.[4] In fact, over two-thirds of workers affected by recent rises in the minimum wage are adults -- disproportionately women and minorities. Thirty percent of those affected by a minimum-wage increase are the sole wage-earner in their family, and, on average, minimum-wage earners account for one-half of their family's total earnings. Relative to other workers, individuals whose earnings are affected by a rise in the minimum wage are three times more likely to live in poverty.

In the second section of the paper we examine the effect of the minimum wage on the overall distribution of wages. As is well known, wage inequality widened significantly in the past decade (Levy and Murnane (1992)). For example, Figures 1a and 1b show two measures of hourly wage inequality for female and male workers from 1973 to 1992.[5] Several authors, including Blackburn, Bloom, and Freeman (1990) and DiNardo, Fortin, and Lemieux (1994),

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[3]Following a long tradition (e.g. Lewis (1963), Gramlich (1976), Freeman and Medoff (1984)) we make no attempt to adjust wages or earnings for such potentially important factors as taxes, income-contingent transfers, or changes in the conditions of work. We also ignore the potential effects of a rise in the minimum wage on the cost of living.

[4]For example, Peter Passell wrote in the February 1993 New York Times that ..."much of the gain from a higher minimum wage would go to surfboards and stereos -- not into rent and baby formula."

[5]These figures are taken from Card and Lemieux (1994), and are based on wage rates reported for each individual's main job.

have suggested that part of the rise in wage dispersion during the 1980s is attributable to the decline in the real value of the minimum wage over the decade. A direct test of the effect of the minimum wage is provided by comparing the relative changes in wage inequality across states following the 1990 and 1991 increases in the federal minimum wage. In the United States as a whole about 7 percent of workers were directly affected by the 1990-91 minimum wage hikes. Across states, however, this fraction ranged from less than 2 percent (in states like Alaska and California) to more than 20 percent (in states like Mississippi and New Mexico). In states with a higher fraction of workers affected by the minimum wage changes, we find that the rise in the federal minimum wage led to significant increases in the lower percentiles of earnings, and a significant narrowing of wage inequality.

In the third section of the paper, we analyze the effects of the recent federal minimum wage hikes on the distribution of family earnings. As in our analysis of the distribution of wages, we make use of the natural experiment afforded by differences across states in the fraction of workers affected by the minimum wage. The family earnings characteristics of affected workers before the increases in the minimum suggest that about one-third of the overall pay increases associated with the minimum-wage hikes should have gone to families in the lowest decile of the family earnings distribution.[6] Consistent with this prediction, our analysis of actual changes in family earnings from 1989 to 1991 shows that the rise in the federal minimum wage led to significant increases in the 10th percentile of family earnings, and a

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[6]Our evidence suggests that a larger fraction of the earnings gains from a higher minimum wage go to families with lower incomes than the recent study by Horrigan and Mincy (1992). We discuss the reasons for the discrepancy below.

narrowing of the gap between the 90th and 10th percentiles of family earnings, in states with a higher fraction of affected workers.

The final section of the paper examines the connection between minimum wages and poverty. As other researchers have noted, this connection is fuzzy: only about one-third of adults who are classified as "poor" actually work; and only a fraction of the working poor earn sufficiently low wages to be affected by an increase in the minimum wage. Nevertheless, 30 percent of all workers affected by the minimum wage are poor or near-poor, so that a minimum-wage increase could be expected to lead to some reduction in the fraction of working poor. Following the methods established in the earlier sections of the paper we examine inter-state differences in poverty trends after the 1990 and 1991 rises in the federal minimum wage. The effect of the minimum wage on the overall poverty rate of adults is very imprecisely estimated. We find slightly stronger evidence of an effect on the poverty rate among families with some attachment to the labor market.

I. Who is Affected by the Minimum Wage?

An increase in the legal minimum wage has a direct effect on two types of workers: (1) those who were previously earning the old minimum wage; and (2) those who were earning more than the old minimum but less than the new minimum. Assuming that their employers choose to comply with the new minimum wage law, these workers must either receive pay raises or lose their jobs. Some workers who previously earned more than the new minimum may also benefit from a "ripple" or "spillover" effect (Grossman (1983)), although the available evidence suggests that such effects are confined to a relatively narrow range above the new minimum (Katz and Krueger (1992)). In addition,

some workers who previously earned less than the old minimum wage may be indirectly affected -- for example, by a "crowding effect" associated with the flow of workers into uncovered and non-complying sectors of the economy. Tabulations presented in Card (1992a, 1992b) and Card and Krueger (1995, chapters 3 and 4) show that the fraction of workers earning less than the old minimum wage tends to remain constant or decline after an increase in the minimum wage, suggesting that any crowding effect is negligible. For the most part, then, the 1990-1991 increases in the federal minimum wage affected those workers who were earning between $3.35 and $4.24 per hour in early 1990.

How do these workers compare to other workers in terms of their personal and family characteristics? To answer these questions we drew a sample of wage and salary earners from the January-March 1990 Current Population Survey (CPS).[7] This data set provides us with a "snapshot" of the workforce just prior to the 1990 minimum wage hike. We identified three groups of workers in this snapshot sample: "subminimum-wage" workers, with hourly wages below $3.35; "affected" workers, with hourly wages between $3.35 and $4.24; and all other workers. A more complete description of the samples is provided in the Data Appendix.

Table 1 presents descriptive information on workers in the different wage categories. Most of the information pertains to the survey week of the CPS, although the family income, program participation, and poverty status information in rows 10-15 and 24-25 pertains to the previous calendar year (and is only available for observations from the March CPS). The first column of the table reports the average characteristics of all wage and salary

[7]Self-employed workers are exempt from the minimum wage and are excluded from the tabulations. By "wage and salary workers" we mean those people who report themselves as working for pay for a private or government employer.

workers in the labor force. Slightly fewer than one-half (47.6 percent) of all workers are women, roughly 14 percent are non-white (black, Asian, or "other"), and about 8 percent are of Hispanic origin. Teenagers, whose employment patterns figure so prominently in the minimum wage literature, comprise less than 6 percent of total employment. Forty-one percent of workers are the sole wage-earner in their family, either because they live alone, or because they live with other family members who do not work.[8] As shown in row 23, a typical wage earner accounts for 68 percent of his or her family's total weekly earnings.

The average family income in 1989 for people who were employed in March 1990 was $38,067 (row 10). One and one-half percent of workers lived in families that reported receiving some public assistance or welfare payments in the previous year, while 3 percent lived in households that received food stamps. Based on their income in the previous year, 5 percent of all workers in March 1990 were classified as poor, and another 6 percent were classified as near-poor (with family incomes between 100% and 150% of the appropriate poverty line, adjusted for family size and composition). These relatively low poverty rates reflect the exclusion of nonworkers from our sample. The poverty rate for all adults (workers and nonworkers) in 1989 was 10.6 percent.

A comparison of the second and third columns of Table 1 with the first column shows how subminimum-wage workers and workers who were affected by the rise in the minimum wage differ from the overall workforce. Focus for the moment on affected workers (column 3). This group contains proportionally more women and nonwhites than does the population as a whole, and a much

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[8]We use the term "family" to include both multi-person families and individuals who live alone.

larger fraction of young workers. Just under one-third of affected workers are 16-to-24 year olds enrolled in school. The stereotype of minimum wage workers as youths who are working after school is therefore partially correct. Nevertheless, nearly one-half of all workers affected by the minimum wage are older than age 24, many of the younger workers are out of school.

The family circumstances of affected workers also differ from those of other workers. Family incomes of affected workers are about 25 percent lower than average ($29,500 per year versus $38,100) and the percentage of affected workers in poverty is three times higher than average (19.7% versus 5.1%). The poverty gap (i.e., the average income per family needed to move the family out of poverty) is also substantially higher for the families of workers who were earning between $3.35 and $4.24 per hour in March 1990. Affected workers are about three times more likely to live in families that received welfare payments or food stamps in the previous year.

Compared with other workers, affected workers are slightly less likely to live alone, and are also less likely to be the sole wage-earner in their families. Affected earners work fewer hours than do most other workers, and earn substantially less per week ($114 per week versus $427 per week for all workers). Nevertheless, affected workers contribute a sizable fraction of their family's current weekly earnings (51 percent, on average, according to the data in row 23), and account for just under one-half of their total family earnings in the previous year (see row 25). Evidently, the earnings of workers who are affected by a minimum wage hike are important for many families.

Workers who earned less than $3.35 per hour present an interesting contrast to those earning between $3.35 and $4.24. Subminimum-wage earners

are older, less likely to be nonwhite or Hispanic, and less likely to be enrolled in school than those earning $3.35-$4.24. They also have slightly higher family incomes, slightly lower poverty rates, and slightly higher earnings in the previous year. Some of these differences may be attributable to misclassification errors. Labor market data are sometimes misreported to the CPS, leading to inadvertent errors in the identification of subminimum-wage earners. Indeed, examination of individual records in the CPS suggests that a significant fraction of subminimum-wage earners are actually higher-wage earners who have misreported their hours or earnings.[9] In any case, the economic circumstances of workers affected by the minimum wage are likely to be slightly over-stated if subminimum-wage earners are inadvertently included in the group of affected workers.

A. The Distribution of Affected Workers by Income Class

The data in Table 1 show that workers who are affected by recent increases in the federal minimum wage live in lower-income families and are more likely to be classified as poor than are other workers. A more complete picture of the family income distribution of affected workers is presented in Table 2. In constructing this table we have divided all individuals age 16 and older, including workers and non-workers, into 10 equally-sized groups on the basis of their total family income. Within each decile we calculate the fraction of individuals classified as poor (column 1), the fraction classified as near-poor (column 2), the fraction working at the time of the CPS survey

[9]Subminimum-wage earners are more likely to report being paid by the week or month than those earning $3.35-$4.24 per hour. For salaried workers we have to compute an hourly wage by dividing average weekly earnings by average weekly hours. Since weekly hours are often misreported, this procedure induces some extra measurement error in the wages of salaried workers.

(column 3), and the share of workers in the decile with hourly wages in the $3.35-$4.24 range (column 4). Finally, in column 5, we show the percentage of all affected workers in the corresponding family income decile.

These simple distributional data illustrate two important points. First, the fraction of workers affected by a rise in the minimum wage declines sharply across the income deciles: from 29 percent of workers in the first (lowest) decile to 3 percent in the tenth (highest) decile. Second, even though relatively fewer people in the lower-income deciles participate in the labor market, the bulk of workers affected by a rise in the minimum wage are in these deciles. Indeed, 43 percent of all affected workers come from the bottom three income deciles. These patterns suggest that a lower-income families received a disproportionate share of the earnings gains arising from the 1990-91 increases in the minimum wage. Nevertheless, many workers affected by the minimum wage live in upper-income families. The minimum wage is evidently a "blunt instrument" for redistributing income to the poorest families.

The conclusion that minimum wage earners are disproportionately drawn from lower-income families is consistent with many earlier studies of the issue, including those by Gramlich (1976) and Kohen and Gilroy (1982). However, as shown in Figure 2, the income disparity between wage earners who are affected by an increase in the minimum wage and other workers has widened over the past two decades. In this figure we plot the percentage of affected workers with family incomes below a given cutoff against the percentage of <u>all</u> workers whose family income is below the same cutoff, using three different data sources: (1) 1990 data from Table 2; (2) 1973 data derived from the March and May 1973 CPS files; and (3) 1973 data reported by Gramlich (also derived

from 1973 CPS files). As a benchmark we also plot the 45 degree line in the figure: if affected workers were distributed across family income categories with the same probabilities as other workers, then all the points in Figure 2 would lie along this line.

As suggested by the results in Table 2, the 1990 relative distribution is well above the 45 degree line, indicating that workers who were affected by the 1990-91 increases in the federal minimum wage were from poorer families than other workers.[10] To derive a comparison for the 1974 increase in the federal minimum wage (from $1.60 to $2.00 per hour) we used a matched sample of observations from the March and May 1973 CPS to assign family incomes (from the March file) to workers (in the May file). We defined the affected workers as those individuals who earned between $1.60 and 1.99 per hour in May 1973. We then sorted workers in the matched 1973 file into family income groups, choosing the income ranges to include the same relative fractions of all workers as the income ranges in our 1990 sample. Finally, as a check on our tabulations, we computed the relative fractions of affected workers and all workers across 5 broad income categories, using the 1973 data reported in Gramlich (1976, Tables 10 and 11).

The relative distributions of affected workers in 1973 are very similar whether we use our own or Gramlich's tabulations. Both are above the 45 degree line but below the 1990 relative distribution. Thus, relative to workers affected by the 1974 increase in the minimum wage, workers affected by the 1990-91 increases were more likely to come from <u>further down</u> the family

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[10]Note that the income deciles in Table 2 are for all individuals, whereas the analysis in Figure 2 is restricted to workers only.

income distribution.[11] There are a number of explanations for the relative decline in the family incomes of affected workers. First, the rise in the fraction of individuals who live alone (see Blank and Card (1993)) has presumably strengthened the connection between low individual earnings and low family income. Second, changes in fertility patterns, transfer programs, and other factors have led to a decline in the incomes of families with children relative to the incomes of other families.[12] This trend may have contributed to a decline in the relative family incomes of teenagers, who comprised about 30 percent of all affected workers in both 1973 and 1990. Furthermore, within the working teenage population, the correlation between low family income and low wages has changed. In 1973, Gramlich (1976) found that teenagers in the affected wage range had higher family incomes than other working teens. In 1990, however, teenagers earning between $3.35 and $4.24 per hour had lower family incomes than other teens.[13] A final factor in the changing relative distribution of affected workers is the steady decline in real wages for less-educated workers over the past two decades. We suspect that this trend has

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[11]A similar trend is revealed in a recent study by Burkhauser and Glenn (1994). Data in their Table 1 show that in 1979, 34 percent of all low-wage workers (those whose average hourly earnings over the previous year were less than one-half of the overall average wage) lived in families that were poor or near poor. In 1989, this fraction had risen to 39 percent.

[12]For example, real median family income of all families with children fell by 20 percent between 1974 and 1990, while the real median income of families without children was constant. See U.S. Department of Commerce (1993, Table B-12).

[13]For example, the average family income of teens who earned $3.35-$4.24 per hour in March 1990 was 10 percent less than average family income of higher-wage teens. In 1973, Gramlich (1976, Table 12) reports that teens earning between $1.60 and $2.00 per hour had 10 percent higher *family incomes than teens earning* over $2.00 per hour.

led to a relative decline in the family incomes of non-teenage workers who are at or near the minimum wage.

Although our finding that minimum wage workers tend to have below-average family incomes is consistent with the earlier research of Gramlich (1976) and Kohen and Gilroy (1982), it is inconsistent with a more recent study by Horrigan and Mincy (1993). Horrigan and Mincy used March 1988 data to compare the family incomes of all workers with the incomes of those earning between $3.35 and $4.71 per hour (the minimum wage that would have prevailed in 1987 if the minimum had been indexed to the Consumer Price Index after 1981). Unlike us, they concluded that affected workers are distributed more-or-less uniformly across the family income distribution (Horrigan and Mincy (1993, Table 8.6)).

A number of important differences between Horrigan and Mincy's procedures and ours account for the dramatic difference in conclusions about the relative family-income distribution of affected workers. First, their sample includes only hourly-rated private-sector workers who report the same industry and occupation for their job in March as for the main job in the previous year. By comparison, our sample includes all paid non-self-employed workers in the March survey, whether or not they worked last year, or changed industry or occupation. Second, we compare the family income distribution of affected workers with the distribution for <u>all</u> workers, whereas Horrigan and Mincy compare the family incomes of hourly-rated workers in the affected wage range with the family incomes of all <u>hourly-rated</u> workers. By excluding salaried workers from their tabulations of the income distribution for all workers, Horrigan and Mincy under-represent the upper half of the family

income distribution among workers.[14] We believe that this procedure, in combination with their narrower sample of "stable" workers, accounts for their conclusion that minimum wage workers are evenly distributed across the family income distribution.

To summarize, we find that 17 percent of workers whose wages were affected by the most recent increases in the federal minimum wage live in families with incomes in the bottom decile of family incomes, and that another 13 percent live in families in the second decile of family incomes. We also find that the relative family income distribution of workers who are affected by a rise in the minimum wage has deteriorated during the past two decades. It should be noted that the decline in the relative income status of affected workers may actually understate the fall in the real standard of living for many affected workers. Between 1973 and 1990, real incomes of families in the bottom 20 percent of the income distribution shrank.[15] Thus, the 30 percent of affected workers in the two lowest family income deciles in 1990 were somewhat poorer in real terms than their counterparts in the early 1970s.

II. The Effect of the Minimum Wage on the Distribution of Wages

It is well-known that the minimum wage has a substantial effect on the earnings of less-skilled workers, including teenagers, fast-food workers, and retail trade employees. More generally, the minimum wage serves as a

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[14]In March 1990, the average family income of hourly-rated workers was $37,300 whereas the average family income for salaried workers was $51,360.

[15]Real average family income of families in the bottom fifth of the income distribution fell from $11,069 in 1973 to $10,555 in 1990 (in 1992 dollars). Over the same time period, the average income-to-poverty ratio for families in the bottom fifth of the income distribution fell from 1.12 to 0.99. See U.S. Department of Commerce (1993, Tables B-7 and B-8).

"backstop" for the wages of a significant fraction of all wage and salary workers (DiNardo, Fortin, and Lemieux (1994)). The upper panel of Figure 3, for example, shows the relative frequency distribution of wages in the U.S. economy in the first three months of 1990 -- just prior to the April 1 rise in the minimum wage from $3.35 to $3.80 per hour.[16] Even though the real value of the federal minimum had fallen to its lowest since the early 1950s, and almost one-half of the states had existing state wage floors above $3.35 per hour, 1.2 percent of all workers earned exactly $3.35 per hour in the first quarter of 1990. The middle panel of Figure 3 shows the wage distribution for the same three months of 1991, 9 months after the effective date of the new minimum. The lower tail of the wage distribution has been "swept" to the right, and the previous spike in the wage distribution at $3.35 per hour has been replaced by a spike at $3.80 per hour. The fraction of workers earning less than $3.35, however, remains relatively constant. Finally, the lower panel of Figure 3 shows the wage distribution for the first three months of 1992, almost one year after the second (April 1991) increase in the federal minimum wage to $4.25 per hour. Now, the fraction of workers earning the minimum wage has risen to 3.0 percent, and the old spikes at $3.35 and $4.00 per hour have all but disappeared.

If the distribution of wages remained stable over time in the absence of a change in the minimum wage, then a simple comparison of the upper and lower panels of Figure 3 could be used to estimate the effect of the minimum wage on the overall wage distribution. Over a two-year period, however, wage inflation and other macroeconomic forces normally would be expected to lead to

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[16]These figures are based on January-March CPS surveys conducted in 1989, 1990, and 1991, as described in the Appendix.

some shift in the wage distribution, even if the minimum wage were constant. What is needed is a credible "counterfactual" to estimate what the wage distribution would have looked like in the absence of an increase in the minimum. Following Card (1992a), a natural approach is to use regional or inter-state variation in the level of wages to compare the effects of the federal minimum wage across labor markets.

Figure 4 tracks the 5th and 10th percentiles of wages between the first quarter of 1989 and the last quarter of 1991 in 3 groups of states: a set of 13 low-wage states where the minimum wage would be expected to have a high impact; a set of 17 high-wage states where the minimum wage would be expected to have a small or even zero impact; and a set of 22 medium-wage states where the minimum wage would be expected to have a moderate impact. The classification of states is based on the fraction of teenagers earning between $3.35 and $3.79 per hour in 1989.[17] For reference, the April 1990 and April 1991 minimum wage increases are shown in the figure by vertical lines between the first and second quarters of 1990 and 1991, respectively.

Both the 5th and 10th percentiles of wages in the high wage states drifted upward during the three-year sample period. However, most of the increases in the 5th and 10th percentiles in these states occurred before the

[17]The low-impact group includes 12 states, most of which had passed state-specific minimum wages above $3.35 per hour by late 1989: all of New England, New York, New Jersey, Minnesota, Delaware, Maryland, District of Columbia, Nevada, Washington, California, Alaska, and Hawaii. The high-impact group contains a mix of Southern, Mountain, and North-Central states: West Virginia, South Carolina, Kentucky, Tennessee, Mississippi, Arkansas, Louisiana, Oklahoma, Montana, Wyoming, New Mexico, North Dakota, and South Dakota. The medium-impact group includes the remaining 22 states.

first increase in the federal minimum wage.[18] This feature of the timing of the increases suggests that the structure of wages in the high wage states was largely unaffected by the federal minimum wage hikes. Thus the changes in wage percentiles in the high-wage states can serve as a counterfactual for the growth of the wage percentiles in the other states. On this basis, the data in Figure 4 suggest that the 1990-91 increases in the federal minimum wage raised the 5th percentile of wages in the lowest-wage states by 60 cents (18 percent); and raised the 10th percentile of wages in these states by 25 cents (7 percent).[19] The estimated effect of the minimum wage on the 5th percentile of wages in the middle group of states is similar but the estimated effect on the 10th percentile of wages in these states is zero (since the rise in the 10th percentile of wages is the same in the middle group of states and the high-wage states over the sample period).

One important issue in the interpretation of Figure 4 is whether the measured changes in the 5th and 10th percentiles reflect wage increases for previously low-wage workers, or systematic employment losses for these workers. It is impossible to sort out these competing explanations on the basis of the percentiles of the wage distribution alone. To address the issue, we computed quarterly teenage employment rates in the three groups of states for the period from 1989 to 1992. Since teenagers are typically at the bottom of the wage distribution, we would expect to see a relative decline in the teenage employment rate in the low-wage group of states if the rise in the

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[18]Some of the 1989 increases in the 5th and 10th percentiles in the high-wage states may be due to state-specific minimum wage laws which took effect in many of these states during the year.

[19]These estimates are based on computing differences-in-differences in wage percentiles between 1989-I and 1991-IV between the low wage and high wage states.

minimum wage has a substantial effect on the employment rate of low-wage workers.[20] To control for possible regional differences in the effects of the 1990-91 economic recession, we also computed "adjusted" teenage employment rates, based on the assumption that the teenage employment rate responds to the overall employment rate with a coefficient of 2.5.[21]

The unadjusted and adjusted employment rates are presented in Figure 5. Over the 1989-92 period, teenage employment actually increased in the low-wage group of states relative to trends in the high-wage and medium-wage groups. Some of this increase is attributable to region-specific cyclical effects over the period. Between the first quarter of 1990 and the first quarter of 1992, for example, the overall employment rate (for all workers) fell by 1.3 percentage points in the low-wage (high-impact) states, by 1.1 percent in the medium-wage states, and by 2.8 percent in the high-wage (low-impact) states. Even accounting for these differential cyclical effects, however, teenage employment in the low-wage states rose relative to trends in the high-wage states.[22] We conclude that the relative increase in the 5th and 10th wage percentiles in the low-wage group of states between 1989 and 1992 was not attributable to systematic losses of low-wage jobs, but rather to wage increases for previously low-wage workers.

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[20]A similar test is presented in Card (1990a), using data from 1989 to 1990.

[21]This coefficient is at the upper end of the range of estimates usually found in the literature. For example, a regression of the teenage employment rate on the overall employment rate and a linear trend, estimated with annual data for 1975-89, gives the following equation:

Teen Employment = Constant - 0.86*Trend + 2.17*Overall Employment Rate.

The R-squared of this model is 0.99.

[22]Further analysis of these data is reported in Card and Krueger (1995, chapter 4).

A. Comparisons Across States

Although the grouped analysis in Figure 4 is straightforward and highlights the precise timing of changes in the wage percentiles, aggregation into only 3 groups makes statistical inference rather difficult. An alternative approach is to aggregate several months of data at the beginning and end of the 1989-1991 sample period for each state and use information on the changes in wages across all 50 states and the District of Columbia. This approach is followed in the regression models reported in Table 3, and in the graphical analysis in Figure 6. For each state, we have used data for April-December of 1989 and corresponding data for 1991 to compute the 5th, 10th, 25th, 50th, and 90th percentiles of wages before and after the most recent round of minimum wage increases. We also used the April-December 1989 data to compute the fraction of "affected" workers in each state -- i.e., the fraction who were earning between $3.35 and $4.24 per hour. Each panel of Figure 6 plots the changes in the indicated wage percentiles for the 51 states (counting D.C. as a state) against the fraction of affected workers in the state. Corresponding regression models, with and without an additional control variable representing the change in the overall employment-population rate in the state, are reported in Table 3.

The graphs and the estimated regression models lead to similar conclusions. The changes in the 5th and 10th percentiles of wages across states are strongly positively correlated with the fraction of workers who were earning initially between $3.35 and $4.24 per hour in the state. At the higher wage percentiles, by comparison, there is little evidence of a correlation between wage growth and the fraction affected variable. A possible exception is the 50th percentile. Although the graph shows no

obvious relation between the growth rate of median wages and the fraction of affected workers in 1989, the regression models reveal a marginally significant effect. The explanation for this apparent discrepancy is the influence of the data for California. In the regression models, which are estimated by weighted least squares using relative population sizes as weights, California (which had a low fraction affected and no change in the median wage) is a "leverage point", and its influence drives up the magnitude and statistical significance of the estimated regression coefficient. If we eliminate California from the data set the estimated coefficient is small and statistically insignificant. Given this result, and the results for the 25th and 90th percentiles of wages, we suspect that the rise in the minimum wage probably had little effect on the distribution of wages at or above the 25th percentile.

The addition of the employment-population rate as a control variable for differing labor market trends across states has little influence on the estimated models in Table 3. We have also estimated specifications that include the change in the state's unemployment rate, and models that include the levels of the state employment-population rate for 1989, 1990, and 1991. All of these specifications lead to similar coefficient estimates for the critical fraction affected variable.

The lower panel of Table 3 reports estimates of regression models in which the dependent variable is the state-specific log wage gap between the 90th and 10th percentiles of wages (columns 1-2); the 50th and 10th percentiles of wages (columns 3-4); or the 90th and 50th percentiles of wages (columns 5-6). These models indicate that the rise in the federal minimum wage was responsible for a significant compression of the wage distribution in

states with a high fraction of workers affected by the minimum wage increases. For example, the estimates imply that the 90-10 log wage gap closed by 0.09-0.11 in New Mexico (fraction affected = 0.17) relative to California (fraction affected = 0.02) as a consequence of the federal minimum wage. This represents a reduction in the log wage gap of approximately 7 percent.

As in the grouped analysis in Figure 5, one might ask whether the impact of the federal minimum wage on the lower percentiles of the wage distribution represents the effect of wage increases for low-wage workers, or employment losses. To answer this question we fit models similar to those in the upper panel of Table 3 to the change in the teenage employment rate in each state.[23] If the rise in minimum wage leads to employment cuts for low-wage workers, we would expect these losses to be particularly pronounced for teenage workers. The estimates give no indication that changes in teenage employment from 1989 to 1991 are negatively related to the fraction of affected workers in a state.[24] In Card and Krueger (1995, chapter 4) we present a wide variety of alternative estimates of the employment effect of the 1990-91 federal minimum wage increases, including estimates of the effect on restaurant and retail trade employment. None of the specifications show a negative effect of the fraction-affected variable on state-specific employment outcomes. We conclude that the estimated effects of the federal minimum wage

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[23]See also Card (1992a) and Card, Katz and Krueger (1994) for related estimates.

[24]Without controlling for changes in the overall employment rate in the state, the coefficient of the fraction affected variable is 0.13, with a standard error of 0.04. Controlling for changes in the overall employment rate, the coefficient of the fraction affected variable is 0.04, with a standard error of 0.04. These estimates are based on employment rates in April-December of 1989 and April-December of 1991. Similar estimates are obtained comparing 1989 and 1992 teenage employment rates by state.

on the lower percentiles of wage distribution arise through wage increases, rather than employment losses, among low-wage workers.

We can use the estimates in Table 3 to get a rough sense of the size of the effect of the 1990-91 minimum wage hikes on economy-wide wage dispersion. During 1989, the fraction of affected workers in the U.S. as a whole was 0.087. Multiplying this fraction by the estimated coefficients in columns 1 and 2 of Panel B in Table 3, we obtain an estimated effect of -0.055 to -0.066 on the economy-wide 90-10 log wage gap.[25] Over the 1979-89 period, the 90-10 log wage gap rose by 0.34 for female workers, and by 0.19 for male workers (see Figures 1a and 1b). Thus, the potential effect of the minimum wage is on the order of 20-30 percent of the accumulated rise in wage dispersion over the past decade. It is interesting to note that these estimates are roughly similar to DiNardo, Fortin, and Lemieux's (1994) estimates of the share of the increase in wage dispersion over the 1980s attributable to the decline in the real minimum wage between 1979 and 1989.

III. Effects on the Distribution of Family Earnings for Working Families

As we noted in the introduction, one of the main questions concerning the effect of the minimum wage is whether the earnings gains generated by a rise in the minimum tend to be distributed toward families with higher or lower incomes. Because the minimum wage can only affect the incomes of families with at least one worker, and because most families get a large fraction of their income from labor earnings, it is important to understand

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[25]Since the wage percentiles for the U.S. as a whole cannot be written as weighted averages of the wage percentiles in each of the states, this procedure is not strictly correct. Nevertheless, it gives a sense of the potential effect of the minimum wage hikes.

how the minimum wage affects the distribution of earnings across families. Fortunately, the CPS earnings supplement files can be used to construct estimates of the distribution of total weekly family earnings before and after the rise in the federal minimum wage. This data source has the important feature that the wage and family earnings information both pertain to the survey week. By comparison, the March CPS data (used in Table 2, and by previous researchers who have attempted to study the distributional effect of the minimum wage) combines wage information for the survey week in March with family earnings or income for the previous year.

In constructing our estimates of the family earnings distribution we have made allowances for two features of the CPS earnings supplements: (1) the over-representation of families with multiple earners; and (2) the undercount of earnings for families with self-employed workers. Details of our procedures for handling these issues are presented in the Data Appendix. In brief, we adjust for multiple earners per family by weighting each individual's data by the number of earners in his or her family. We adjust for the non-reporting of self-employment earnings by deleting information for any wage-earner whose family includes a self-employed worker, and re-weighting the remaining observations.[26]

The potential effect of the minimum wage on the distribution of family earnings depends on how affected workers are allocated across families. This distribution is illustrated in Table 4, which is based on data for all wage and salary earners in the earnings supplement files of the January-March 1990 CPS. The first column of the table gives the percent of all workers in a

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[26]This procedure implicitly assumes that the incidence of self-employment is randomly distributed across the working population.

given decile group with wages in the affected range ($3.35-$4.24 per hour). The second column shows the family earnings distribution of affected workers. A key fact that emerges from the two columns is the high concentration of affected workers in low-earnings families: 34 percent of all workers in the first decile are affected by the minimum wage; and 36 percent of all affected workers live in families in the lowest earnings decile.

The family earnings gains generated by an increase in the minimum wage are proportional to the fraction of total family hours in the affected range. As shown in the third and fourth columns of Table 4, affected workers tend to work fewer hours per week than unaffected workers. In the lowest earnings decile, however, affected workers actually work more than do other wage earners. These patterns imply that the overall fraction of "affected hours" in the economy (i.e., the fraction of hours worked by those with wages between $3.35 and 4.24 per hour) is less than the overall fraction of affected workers (5.5% of hours versus 7.4% of workers), but that, for families in the first decile of earnings, the fraction of affected hours is slightly higher than the fraction of affected workers (35.7% versus 34.4%). On the basis of the hours distribution in the last column of the table, we conclude that about one third of the earnings gains attributable to the rise in the 1990-91 increases in the federal minimum wage should have accrued to families in the lowest decile of the family earnings distribution.

To measure the actual effects of the minimum wage on the distribution of family earnings we computed state-specific estimates of the 10th, 50th, and 90th percentiles of total weekly family earnings for April-December of 1989 and April-December of 1991. We then correlated state-specific growth rates in the various earnings deciles with the fraction of workers in the state who

were affected by the minimum wage increase -- the same measure of the impact of the minimum wage used in the previous section. Figure 7 presents plots of the changes in the various earnings percentiles against the fraction affected measure. Table 5 reports estimated regression models (analogous to the models in Table 3) that relate the change in a specific percentile of total family earnings to the fraction affected variable and a control variable representing the change in the state employment-to-population rate between 1989 and 1991.

Again, the plots and the regression models lead to similar conclusions. They both indicate a strong positive correlation between the change in the 10th percentile of family earnings and the fraction of workers affected by the minimum wage in the state. The relationship is somewhat attenuated, but still highly significant, when state-specific employment trends are taken into account. The estimated coefficients imply that the federal minimum wage hike led to a 10-14 percent faster rise in the 10th percentile of weekly family earnings in a more-highly-affected state (like New Mexico) than in a less-highly-affected state (like California).

This estimate of the effect of the minimum wage on the 10th percentile of family earnings is fairly similar to our estimate of the effect of the minimum wage on the 10th percentile of wages. Intuitively, one might have expected a smaller effect of the minimum wage on the 10th percentile of <u>family earnings</u> than on the 10th percentile of <u>wages</u>, since not all the wage earners in families at the 10th percentile of family earnings are directly affected by the minimum wage. However, this intuition is misleading, because the effect of the minimum wage on a given percentile of family earnings depends on what fraction of earnings are contributed by affected workers in families at that point in the earnings distribution. For example, suppose that the minimum

wage affects only the lowest 5 percent of wages in a given state, with no "ripple effect" on the higher percentiles of wages. If some of the affected workers live in families with earnings equal to the 10th percentile of family earnings, then the increase in the minimum wage will raise the 10th percentile of family earnings in the state, although it has no effect on the 10th percentile of wages.

The estimated coefficients of the fraction affected variable in models for the change in median family earnings (columns 3 and 4 of Table 5) suggest that the rise in the minimum wage also had some effect on median family earnings in states with a high fraction of affected workers. For example, the coefficients imply that median weekly family earnings rose 5-6 percent faster in New Mexico than California between 1989 and 1991. On the other hand, the estimates for the 90th percentile of family earnings (columns 5-6) suggest that the minimum wage increase had no effect on the upper tail of the family earnings distribution.[27] The estimated models for the 90-10 and 50-10 percentile gaps (columns 7-10) indicate a substantial effect of the federal minimum wage on the dispersion in weekly family earnings.

Although these results suggest that the minimum wage has a significant effect on the distribution of family earnings, it is difficult to get a sense of the size of the effect by looking only at the percentiles of family earnings. An alternative way to measure distributional impacts is to look at

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[27]We have also analyzed the 5th and 25th percentiles of family earnings. The estimated coefficients of the fraction affected variable for the 5th percentile of family earnings are positive and highly significant, but slightly lower than the coefficients for the 10th percentile (e.g. the estimate is 0.78, with a standard error of 0.30, for a model with no control variables). The estimated coefficients in the models for the 25th percentile are likewise slightly smaller than the estimated coefficients for the 50th percentile (e.g. 0.38, with a standard error of 0.13, for a model with no controls).

the effects of the minimum wage on the share of total earnings received by families in the bottom decile. We used data for April-December of 1989 and 1991 to calculate the earnings shares of the lowest-decile families in the three groups of states defined in Figures 4 and 5. The results are summarized in Table 6. In 1989, families in the lowest decile earned between 1.9 and 2.0 percent of total family earnings in all three state groups. Over the next two years the earnings share of the lowest 10 percent of families rose by 0.08 percentage points (or 4.3 percent) in the high-impact (low-wage) states, while it fell by 0.03 and 0.06 percentage points in the medium and low-impact states, respectively. A difference-of-differences of the 1989-91 changes suggests that the minimum wage increased the earnings share of the lowest decile by 0.15 percentage points (6 percent) in the low-wage states relative to the high-wage states. The overall effect on the lowest 10 percent of families in the entire U.S. is therefore no larger than a 0.15 percentage point increase in earnings share.

How reasonable is this estimate? Recall from Table 1 that prior to the rise in the federal minimum wage, 7.4 percent of all workers were earning between $3.35 and $4.24 per hour, and that the average wage of these affected workers was $3.77 per hour If the minimum wage increase raised wages for workers in the affected wage to $4.25 per hour (with no effect on subminimum-wage workers, no "ripple effect" for higher-wage workers, and no employment effects), then affected workers would receive an average 48 cent per hour pay raise. Multiplying this hourly raise by average hours per week of affected workers (28.1) and assuming a total workforce of 105 million wage and salary workers in early 1990, we estimate that the 1990-91 increase in the federal minimum wage raised wages by $105 million per week, or $5.5 billion per year.

In 1990 there were approximately 81 million families with earnings (including unrelated individuals as families), with average family earnings of approximately $650 per week. Thus, ignoring any employment effects or wage effects on higher- or lower-wage workers, the minimum wage rise was equivalent to a transfer of approximately 0.20 percent of total earnings. According to Table 4, 35 percent of the earnings gains from the minimum wage hike, or approximately 0.07 percentage points of total earnings, should have accrued to families in the lowest decile of earnings. This is smaller than the maximum 0.15 percentage point effect implied by the simple shares analysis in Table 6. Part of the explanation may lie in the fact that the 1990-1991 recession was less severe in the high-impact states, leading to a smaller relative decline in the earnings of low-income families in these states, irrespective of the minimum wage. We suspect that the estimates in Table 6 probably represent an upper bound on the distribution effects of the minimum wage increase.

IV. Effects of the Rise in the Minimum Wage on Poverty Rates

We turn to a final aspect of the potential effect of the minimum wage: its affect on the fraction of individuals living in poverty. The poverty rate is defined as the fraction of individuals whose family income falls short of a family-composition-specific poverty threshold. As noted earlier, the connection between the poverty rate and the minimum wage rate is necessarily limited, since two-thirds of adults who live in poverty do not work, and many poor families have no connection to the labor market. Nevertheless, the minimum wage is sometimes defined as an "anti-poverty program", and much of the political rhetoric from supporters of the minimum wage focuses on its supposed anti-poverty effects.

We used CPS files for March 1990 (one month before the 1990 increase in the minimum wage) and March 1992 (11 months after the 1991 increase) to compute individual poverty rates by state for all individuals aged 16 and older, and for workers (i.e., people who had worked at some time during the previous year). Because the March CPS defines poverty status using family income for the previous calendar year, our poverty rates are properly interpreted as rates for 1989 and 1991. As in our analysis of the distributions of wages and family earnings, we then regressed the change in the state-specific poverty rate on a measure of the fraction of workers in the state affected by the 1990-91 minimum wage hikes, and variables meant to control for state-specific economic trends -- either the change in the state employment-population rate between 1989 and 1991, or the change in the state unemployment rate over the same interval.

The results are presented in Table 7. In the models without any other control variables, the effects of the minimum wage variable on either the overall poverty rate or the poverty rate of workers are negative and marginally significant, suggesting that poverty rates fell faster in states in which the minimum wage had a bigger impact. In the models with controls for changes in economic conditions, the estimated effects are uniformly negative, but not different from 0 at conventional significance levels. To further analyze the determinants of poverty, we also estimated models that included both the change in the state employment rate and a set of indicator variables for the major Census regions (Northeast, South, North-central, and West). The latter control up any unobserved regional trends in economic conditions, government support programs, or family composition that may affect poverty rates. In these models (reported in columns 4 and 8) the estimated

coefficients of the fraction affected variable are negative and small for the overall poverty rate, and negative and somewhat larger for the poverty rate among workers. The coefficient in column 8 implies that the rise in the federal minimum wage led to a 1.6 percentage point decline in the fraction of "working poor" in a state with a high fraction of affected workers (like New Mexico) relative to a state with a low fraction of affected workers (like California). Since the poverty rate among workers in New Mexico in 1991 was 11 percent, this is a relatively large effect.

To better understand the magnitude of the coefficients in the poverty models in Table 7, we used March 1990 CPS data to estimate the maximum fraction of working poor individuals who could be moved out of poverty by a rise in the minimum wage to $4.25 per hour. Specifically, for each individual we calculated the ratio of the family poverty gap (i.e., the amount of money necessary to raise the individual's family out of poverty) to individual earnings in the previous year. We then compared this ratio with the percentage increase in wages that an individual who previously earned less than $4.25 per hour would receive if his or her wages were "topped up" to $4.25 per hour. Using this method, we estimate that a maximum of 12 percent of working poor individuals could be moved out of poverty by the minimum wage.[28] Across states the fraction of "potentially moveable" working poor is positively correlated with the fraction of workers who earned between $3.35 and $4.24 per hour: an increase in the fraction of workers in the affected wage range from 2 to 17 percent (e.g., comparing California to New Mexico) is associated with a 7 percentage point increase in the fraction of "potentially

[28]This estimate is rough because it relies on an hourly wage imputed from total annual earnings, weeks worked, and average hours per week last year.

moveable" working poor (the t-statistic for this estimate is 1.5). The magnitude of our estimated coefficients of the fraction affected variable in models for the change in the fraction of working poor suggest that all of these "potentially moveable" individuals were in fact moved out of poverty by the rise in the federal minimum wage.

In summary, we find some evidence that poverty rates, particularly for working adults, fell more quickly between 1989 and 1991 in states in which the rise in the minimum wage had the largest impact on wages. The imprecision of our estimates makes it difficult to assert confidently that this change was attributable to the minimum wage. Nevertheless, there is no evidence that a rise in the minimum wage leads to an increase in poverty. Rather, our analysis points to a modest poverty-reducing effect of the minimum wage.

V. Conclusions

This paper presents a variety of new evidence on the distributional impact of the minimum wage, based on interstate comparisons of the effects of the 1990 and 1991 increases in the federal minimum wage. Our analysis provides at best a partial description of the overall impact of the minimum wage, since we make no attempt to adjust for any price increases attributable to a higher minimum wage, or to account for any changes in taxes, transfers, or non-wage benefits that may occur with a rise in the minimum. We also ignore any effects of the minimum wage on profits (see Card and Krueger (1995, chapter 10)).

Our main findings are easily summarized. First, we find that workers who were directly affected by the recent rise in the minimum wage were disproportionately drawn from lower-income families. Compared to other

workers, those who were earning between $3.35 and $4.24 per hour in early 1990 had 25 percent lower family incomes and were three times more likely to live in poverty. Second, a comparison of the relative income position of affected workers in 1990 and 1973 (the year used in Gramlich's (1976) classic study) shows that workers who stand to gain from a higher minimum wage now come from families further down the income distribution than two decades ago. Third, in states with a higher fraction of workers affected by the minimum wage change, the recent federal minimum wage hikes led to significant increases in the lower percentiles of wages, and a significant narrowing of wage dispersion. Fourth, these increases also led to increases in the lower percentiles of family earnings, and a narrowing of the dispersion in family earnings. Fifth, the recent increases in the federal minimum wage had little or no measurable effect on overall poverty rates, but may have lowered the poverty rates of families with at least one worker.

Despite these results, it is important to keep in mind that modest increases in the minimum wage have modest distributional effects. The most recent round of increases in the federal minimum wage generated 10-15 percent wage increases for about 7 percent of workers in the economy. We estimate that these pay increases amounted to a transfer of approximately 5.5 billion dollars per year -- or roughly 0.2 percent of total annual earnings. Even if all these transfers were received by families at the bottom of the income distribution (which they were not), the minimum wage would have only a limited effect on the overall distribution of income. Recent research on the minimum wage suggests that the efficiency effects of a moderate minimum wage are relatively small. The findings in this paper suggest that the distributional effects are also small, but tend to equalize wages and earnings.

Data Appendix

The analysis in this paper is based on wage, income, and family earnings data drawn from two sets of Current Population (CPS) data files. Wage and family earnings data are taken from the merged monthly outgoing rotation group files for various months of 1989, 1990, and 1991. In our extracts of these files we include individuals age 16 and older who are employed as paid workers at the time of the CPS survey. Individuals in the extracts who report being paid by the hour on their main job are assigned their reported hourly pay as a "wage". Individuals who report being paid by the week/month/etc. are assigned the ratio of their reported weekly earnings to their reported usual weekly hours as a "wage". Individuals with allocated hourly or weekly earnings are assigned a missing wage, as are individuals whose reported or constructed hourly wage is less than $1.00 per hour or greater than $75 per hour.

The outgoing rotation group files include a measure of total family wage and salary earnings for each individual, along with information on the number of wage and salary earners in the individual's family, and an indicator for whether any other family members are self-employed. In calculating the distributions of family earnings we performed three adjustments to the family earnings data and the CPS sample weights to account for the fact that self-employment earnings are not included in CPS data. First, we set family earnings equal to missing for any individual living in a family with one or more self-employed workers. This change affects approximately 6-8 percent of all individuals who are working as paid workers. Second, we adjusted the sampling weights of individuals living in families with no self-employed family members upward to account for the missing data for individuals with self-employed family members. Third, we divided each individual's sample

weight by the number of earners in his or her family. This adjustment reweights the individual data to take account of the fact that a family with N earners will be included in the sample N times.

Poverty and total family income data are taken from the March 1990, 1991, and 1992 CPS files. In our extracts from these files we include individuals age 16 and older. Family income is based on reported income from all sources for the previous calendar year. The March CPS files include a measure of the appropriate poverty threshold for each family, based on the number family members and the age composition of the family. Poverty status is defined by comparing actual family income to the poverty threshold.

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Table 1: Characteristics of Wage and Salary Workers Just Before the April 1990 Rise in the Minimum Wage

	All Workers (1)	Subminimum Wage Workers (2)	Workers Affected By Minimum (2)
Individual Characteristics:			
1. Female (%)	47.6	63.2	62.1
2. Nonwhite (%)	14.4	14.4	20.6
3. Hispanic (%)	7.7	7.9	9.6
4. Age 16-19 (%)	5.8	18.4	29.4
5. Age 20-24 (%)	11.5	20.2	19.8
6. Enrolled/Age 16-24 (%)	6.5	22.3	30.7
7. < 12 Years Education (%)	15.2	36.6	38.1
Family Characteristics:			
8. Living Alone (%)	18.8	25.3	15.4
9. Only Wage Earner (%)	41.5	46.5	35.9
10. Family Income Last Year	38,067	32,064	29,543
11. Family Received Welfare Last Year	1.5	2.7	4.4
12. Family Received Food Stamps Last Year	3.0	7.8	9.5
13. Family Poor (%)	5.1	14.7	19.7
14. Family Near-Poor (%)	6.1	13.7	13.4
15. Poverty Gap ($)	209.5	625.4	1073.6

continued....

Table 1, continued

Labor Market Characteristics:			
16. Employed in Retail Trade (%)	16.6	42.0	46.7
17. Average Hourly Wage ($)	10.52	2.42	3.77
18. Affected by Minimum (%)	7.4	0.0	100.0
19. Affected by Minimum accounting for tips (%)	6.9	--	92.5
20. Subminimum Wage (%)	2.6	100.0	0.0
21. Average Weekly Hours	38.2	30.6	28.1
22. Average Weekly Earnings ($)	427.0	112.0	114.4
23. Share of Total Weekly Family Earnings	0.68	0.58	0.51
24. Average Earnings Last Year ($)	21,255	6,950	5,774
25. Share of Total Family Earnings Last Year	0.65	0.51	0.45

Notes: Derived from tabulations of January-March 1990 Current Population Surveys. Entries in rows 10-15 and 24-25 are derived from March survey only. Subminimum workers are those whose hourly wage is above $1.00 per hour and below $3.35 per hour. Affected workers are those whose hourly wage is between $3.35 and $4.24 per hour.

Table 2: Distribution of Workers Affected by the April 1990 Rise in the Minimum Wage, by Family Income Decile

	Status of Individuals in Family Income Decile:			Percent of Workers in Decile Affected by Minimum Wage Increase (4)	Percentage Distribution of Affected Workers (5)
	Percent Poor (1)	Percent Near-Poor (2)	Percent Working (3)		
Family Income Decile:					
All	10.6	8.6	62.4	7.1	100.0
1	81.1	16.5	28.3	28.8	17.4
2	21.0	39.7	42.9	13.1	12.7
3	3.8	18.3	53.4	10.5	12.7
4	0.1	9.3	59.9	7.2	9.8
5	0.0	1.5	66.1	6.5	9.9
6	0.0	0.0	68.6	4.6	7.3
7	0.0	0.0	73.8	5.4	9.2
8	0.0	0.0	75.2	4.8	8.1
9	0.0	0.0	78.4	4.7	8.4
10	0.0	0.0	77.5	2.7	4.4

Notes: Derived from tabulation of the March 1990 Current Population Survey. Family income deciles are constructed so that 10% of all individuals age 16 and older are in each decile. Poor individuals are those who live in families with total family income below the appropriate poverty line (taking account of family size). Near-poor are those who live in families with family incomes between 100 and 150% of the poverty line. Affected workers are those whose hourly wage is between $3.35 and $4.24 per hour.

Table 3: Estimated Models for Changes in the Percentiles of Log Wages Across States, 1989 to 1991

Panel A: Models for Changes in the 5th, 10th, 25th, 50th, and 90th Percentiles

	5th Percentile		10th Percentile		25th Percentile		50th Percentile		90th Percentile	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Fraction Affected	1.23	1.18	0.78	0.69	-0.03	0.00	0.22	0.21	0.01	0.06
	(0.13)	(0.16)	(0.11)	(0.14)	(0.11)	(0.14)	(0.10)	(0.12)	(0.08)	(0.10)
2. Change in Employment Rate	--	0.27	--	0.46	--	-0.15	--	0.03	--	-0.27
		(0.50)		(0.42)		(0.41)		(0.36)		(0.31)
3. R-squared	0.63	0.63	0.49	0.50	0.00	0.00	0.09	0.09	0.00	0.02

Notes: Models are estimated on 51 state observations, using data from the 1989 and 1991 Current Population Survey. Dependent variable is the change in the logarithm of the indicated wage percentile from April-December 1989 to April-December 1991. Fraction Affected represents the fraction of wage- and salary earners in the state who earned between $3.35 and $4.24 per hour in April-December 1989. Change in Employment Rate is the change in the employment-population rate for all workers in the state between 1989 and 1991, taken from Geogrphic Profiles of Employment and Unemployment. All models include an unrestricted constant.

Panel B: Models for the Relative Change in the Percentiles of Log Wages

	90th - 10th Percentile		50th - 10th Percentile		90th - 50th Percentile	
	(1)	(2)	(3)	(4)	(5)	(6)
1. Fraction Affected	-0.76	-0.63	-0.56	-0.48	-0.20	-0.14
	(0.15)	(0.18)	(0.15)	(0.19)	(0.10)	(0.12)
2. Change in Employment Rate	--	-0.74	--	-0.44	--	-0.30
		(0.54)		(0.57)		(0.38)
3. R-squared	0.35	0.38	0.21	0.22	0.07	0.09

Notes: See note to panel A. Dependent variable is the change in the differential between the logarithms of the indicated wage percentiles from April-December 1989 to April-December 1991.

Table 4: Distribution of Workers and Hours Affected by the 1990-91 Increases in the Minimum Wage, by Family Earnings Decile

	Percent of Workers in Decile Who Are Affected (1)	Distribution of Affected Workers (percent) (2)	Hours per Week:		Percent of All Hours Worked in the Decile that are Affected (5)	Distribution of Affected Hours (percent) (6)
			Affected Workers (3)	Unaffected Workers (4)		
Family Earnings Decile:						
All	7.4	100.0	28.5	39.1	5.5	100.0
1	34.4	35.6	28.3	26.7	35.7	35.4
2	7.5	7.6	32.5	37.7	6.5	8.7
3	6.6	7.5	31.7	39.2	5.5	8.4
4	7.1	8.4	33.5	39.8	6.1	9.9
5	6.8	8.4	30.6	39.8	5.3	9.1
6	5.4	7.0	28.8	39.8	4.0	7.1
7	5.0	7.4	26.3	40.0	3.3	6.8
8	3.9	6.1	25.1	40.3	2.5	5.4
9	3.6	6.3	23.2	40.2	2.1	5.1
10	3.0	5.6	21.4	41.3	1.6	4.2

Notes: Derived from tabulations of January-March 1990 Current Population Surveys. Affected workers are those whose hourly wage is between $3.35 and $4.24 per hour. Affected hours are hours worked by those wage rate is between $3.35 and $4.24 per hour.

Table 5: Estimated Models for Changes in the Percentiles of Log Weekly Family Earnings Across States, 1989 to 1991

	10th Percentile		50th Percentile		90th Percentile		90th - 10th Percentile		50th - 10th Percentile	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Fraction Affected	1.01	0.72	0.42	0.35	-0.06	-0.14	-1.07	-0.86	-0.58	-0.37
	(0.18)	(0.21)	(0.11)	(0.13)	(0.13)	(0.16)	(0.20)	(0.24)	(0.19)	(0.23)
2. Change in Employment Rate	--	1.55	--	0.45	--	0.43	--	1.12	--	-1.10
		(0.64)		(0.40)		(0.48)		(0.73)		(0.69)
3. R-squared	0.38	0.45	0.24	0.26	0.00	0.02	0.36	0.39	0.16	0.20

Notes: Models are estimated on 51 state observations, using data from the 1989 and 1991 Current Population Survey. Dependent variable is the change in the logarithm of the indicated percentile of total weekly family earnings from April-December 1989 to April-December 1991. See text for derivation of this variable. Fraction Affected represents the fraction of wage and salary earners in the state who earned between $3.35 and $4.24 per hour in April-December 1989. Change in Employment Rate is the change in the employment-population rate for all workers in the state between 1989 and 1991, taken from Geogrphic Profiles of Unemployment and Employment. All models include an unrestricted constant.

Table 6: Shares of Total Earnings Earned by Families in the Lowest Decile of Family Earnings, Before and After the 1990-91 Increases in the Federal Minimum Wage

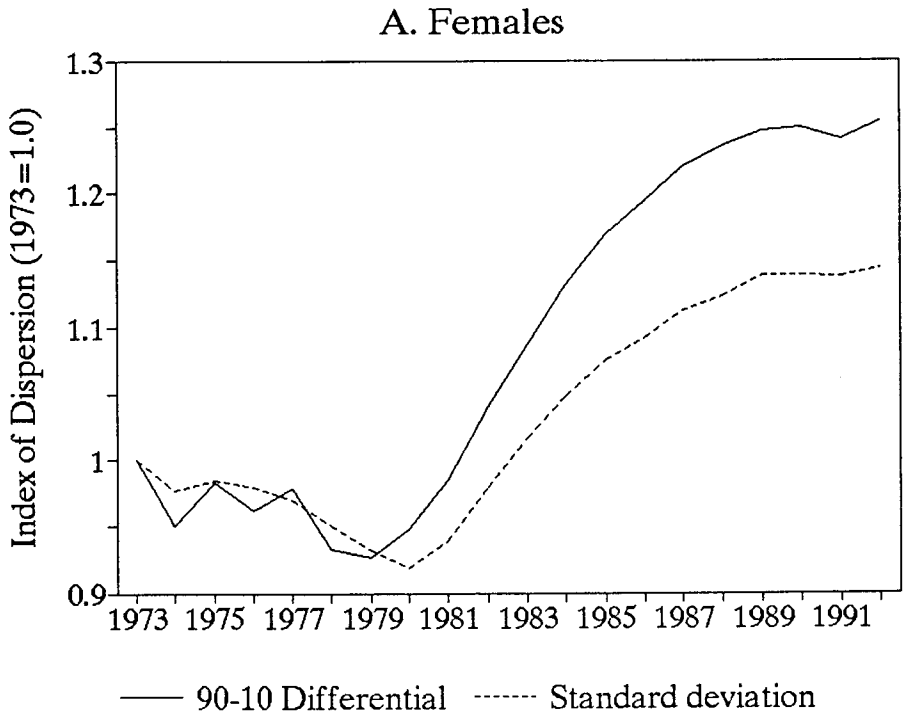
	Earnings Share of Families in First Decile:		
	1989	1991	Change:
State Group:			
1. High Impact	1.87	1.95	0.08
2. Medium Impact	1.88	1.85	-0.03
3. Low Impact	1.98	1.92	-0.06

Note: Table entries represent the share of total weekly family earnings earned by families in the first decile of the family earnings distribution. The three state groups are defined by the impact of the minimum wage on wages in the state.

Table 7: Estimated Models for Changes in the Poverty Rate Across States, 1989 to 1991

	Overall Poverty Rate				Poverty Rate For Workers			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. Fraction Affected	-0.15 (0.08)	-0.06 (0.10)	-0.14 (0.12)	-0.03 (0.11)	-0.13 (0.07)	-0.12 (0.08)	-0.18 (0.10)	-0.12 (0.10)
2. Change in Employment Rate	--	-0.48 (0.31)	--	-0.57 (0.31)	--	-0.06 (0.26)	--	-0.08 (0.27)
3. Change in Unemployment Rate	--	--	0.09 (0.42)	--	--	--	-0.26 (0.36)	--
4. Region Controls	no	no	no	yes	no	no	no	yes
3. R-squared	0.07	0.12	0.07	0.22	0.07	0.07	0.08	0.11

Notes: Models are estimated on 51 state observations using data from the March 1990 and March 1991 Current Population Surveys. Dependent variable in columns 1-4 is the change in the fraction of individuals age 16 and older whose total family income is below the appropriate poverty line (taking account of family size). Dependent variable in columns 5-8 is the change in the fraction of individuals age 16 and older who worked last year and whose total family income is below the appropriate poverty line. Fraction affected represents the fraction of wage and salary earners in the state who earned between $3.35 and $4.24 per hour in April-December 1989. Change in employment rate and unemployment rates are the changes in the employment-population rate and unemployment rate for all workers in the state between 1989 and 1991, taken from Geogrphic Profiles of Unemployment and Employment. Region controls represent indicator variables for 3 Census regions. All models include an unrestricted constant.



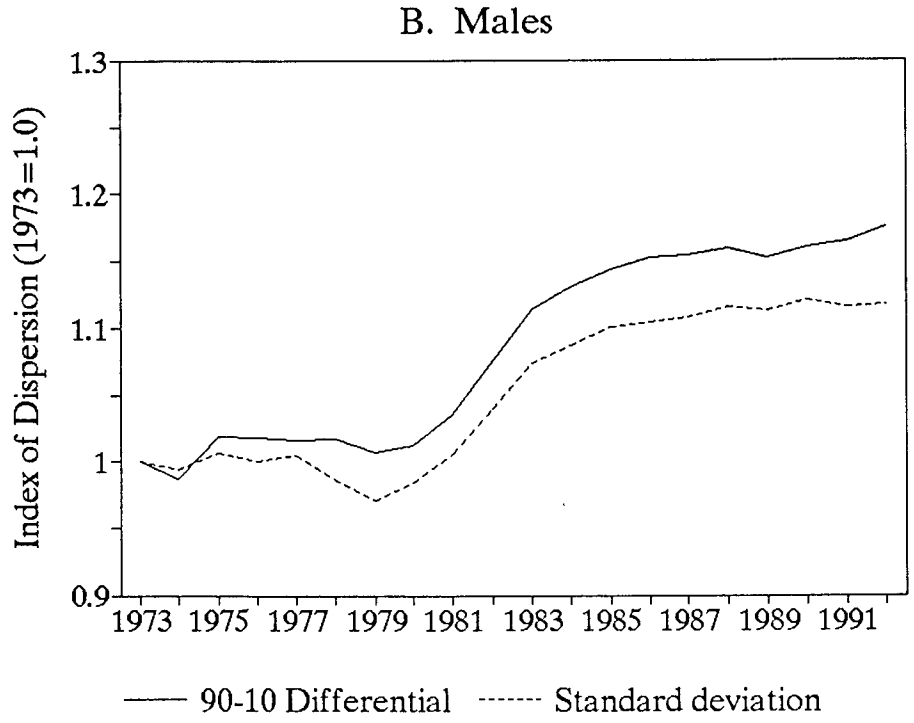


Figure 1: Changes in Wage Inequality, 1973-1992

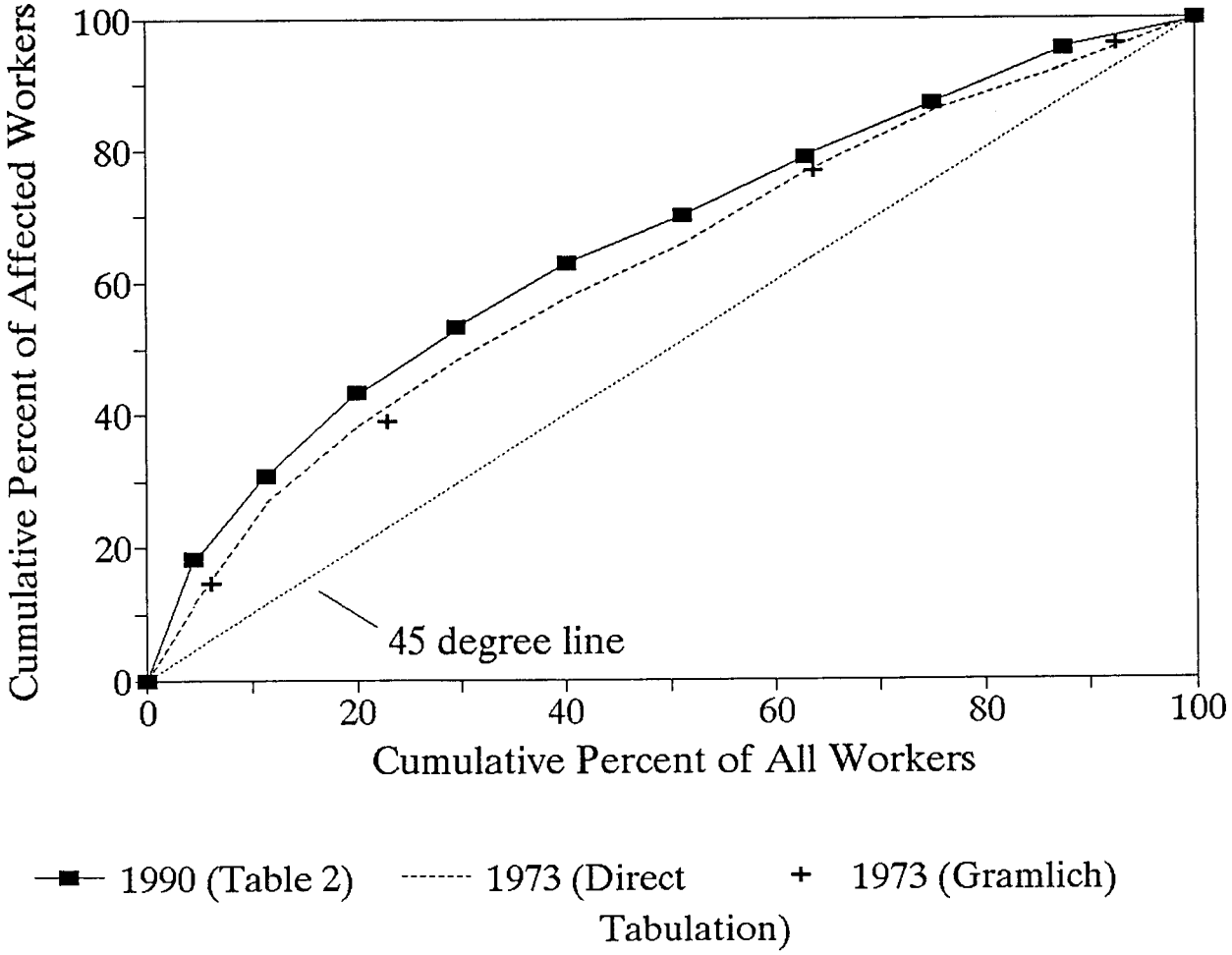
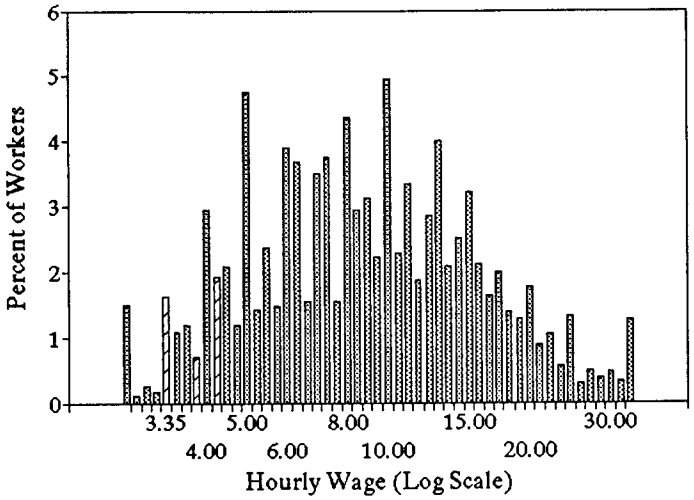
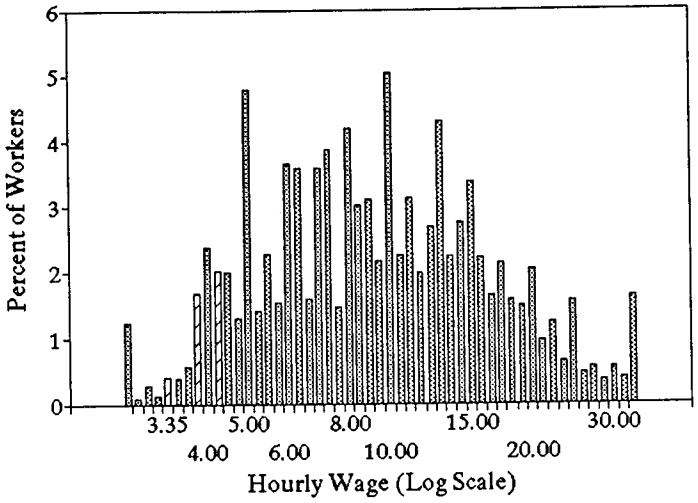


Figure 2: Comparison of the Relative Family Incomes of Affected Workers

A. January-March 1990



B. January-March 1991



C. January-March 1992

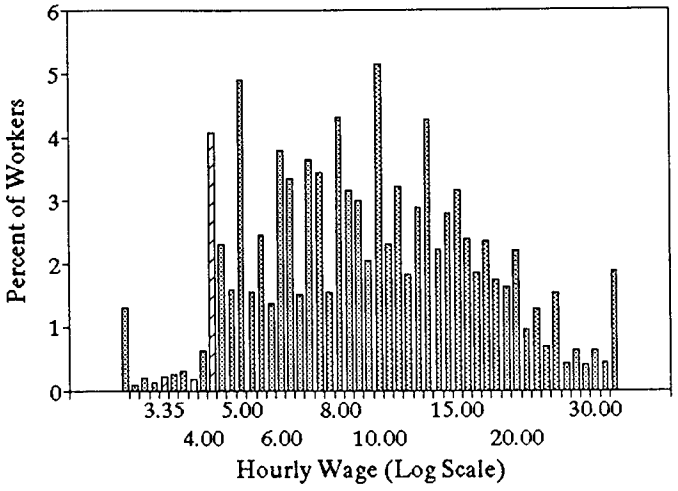


Figure 3: Wage Distributions in First Quarter of 1990, 1991, and 1992

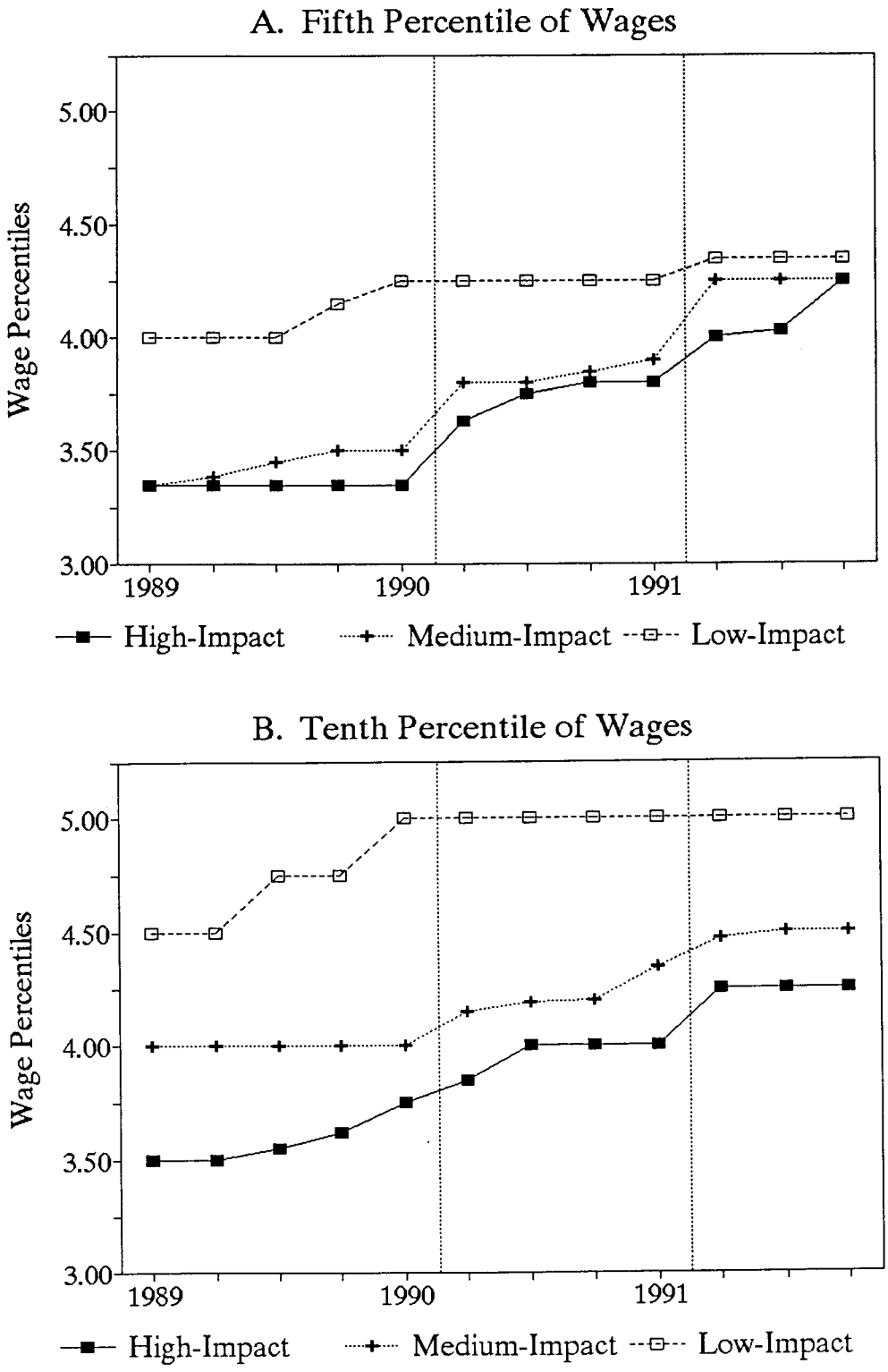


Figure 4: Changes in Wage Percentiles in Three State Groups

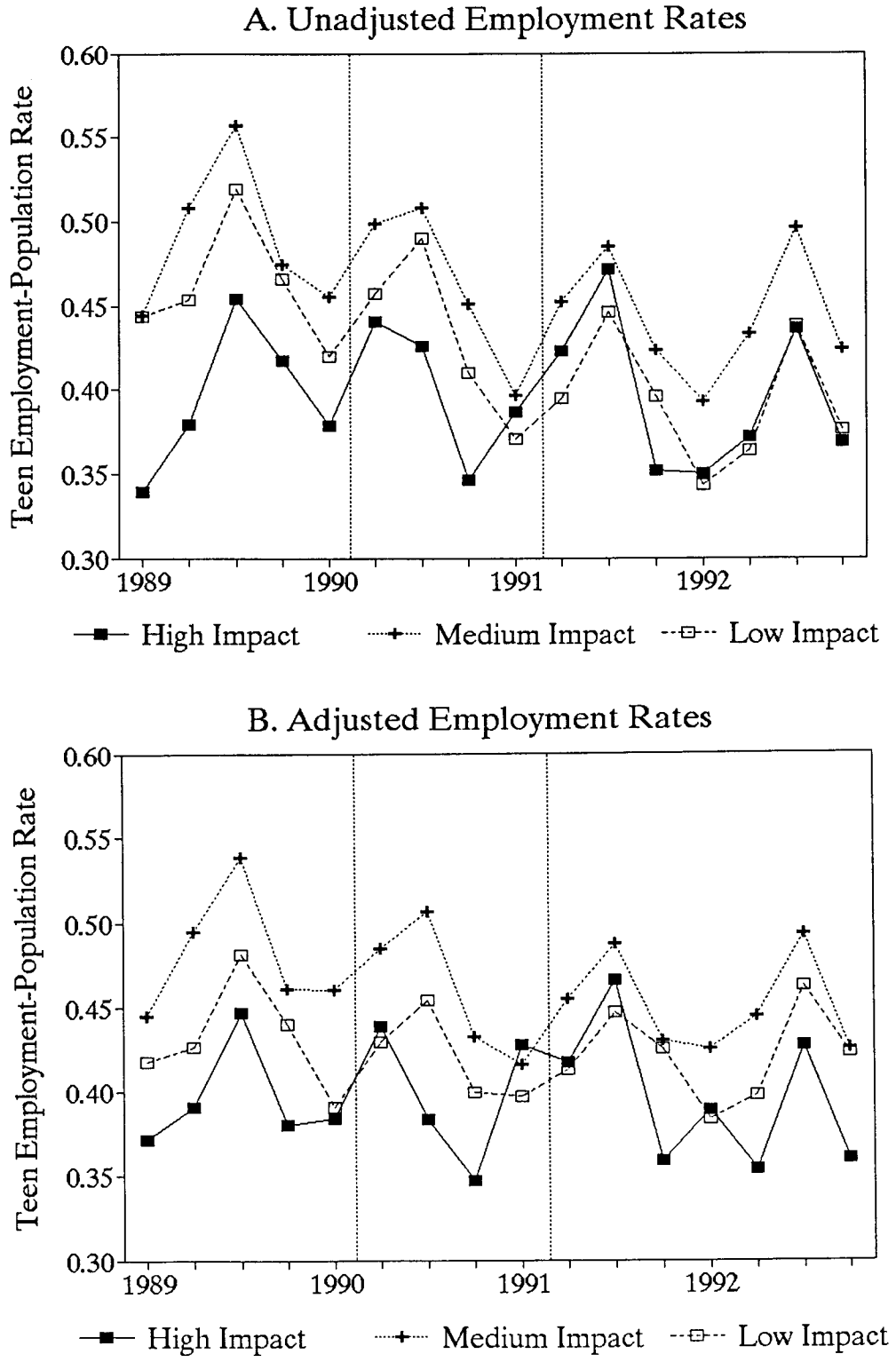
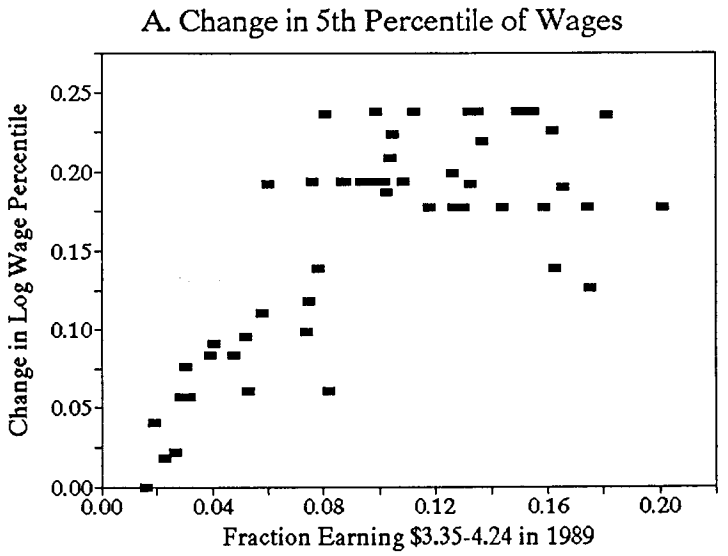
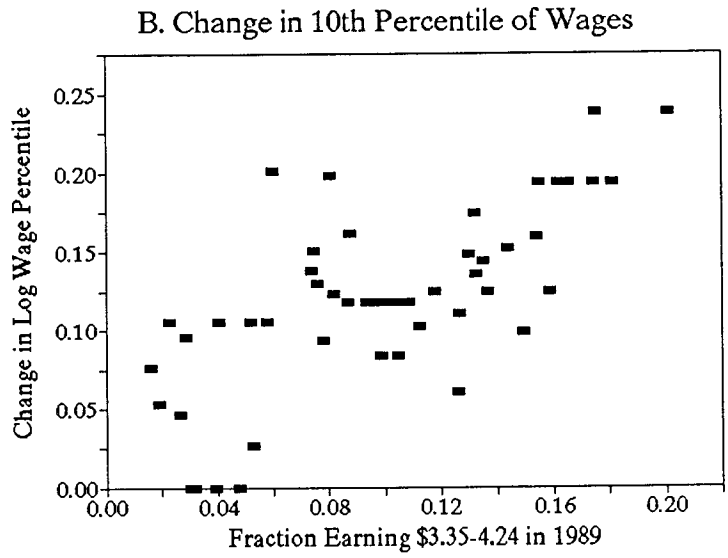


Figure 5: Changes in Teenage Employment Rates in Three State Groups





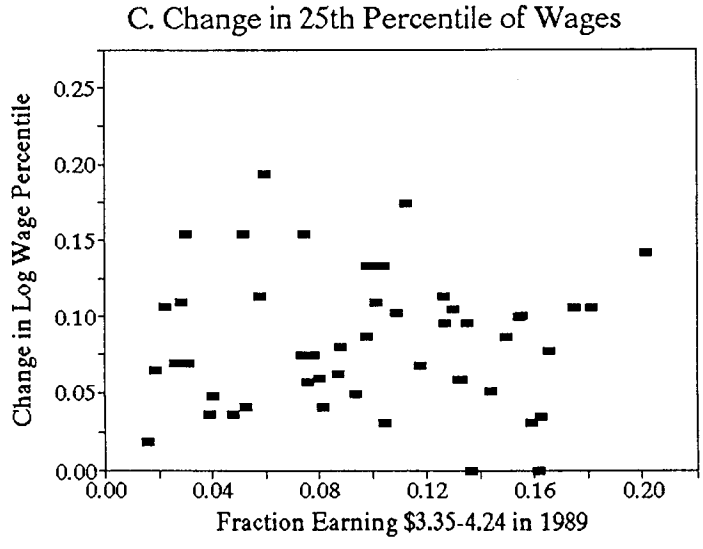
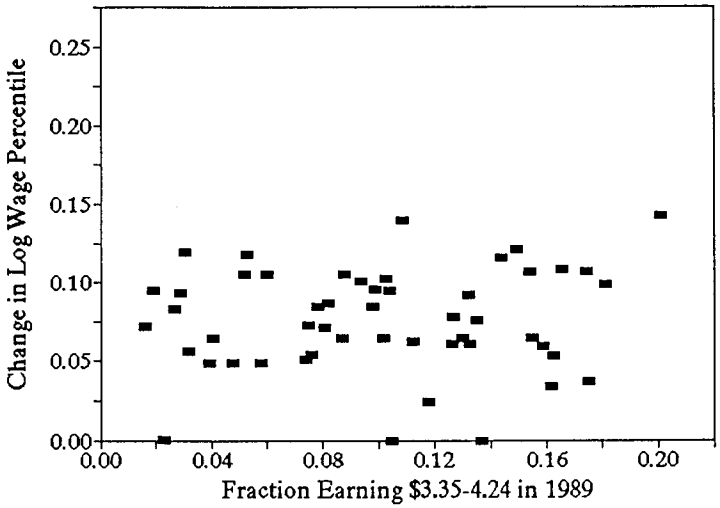


Figure 6: Changes in Wage Percentiles Across States, 1989-1991

D. Change in 50th Percentile of Wages



E. Change in 90th Percentile of Wages

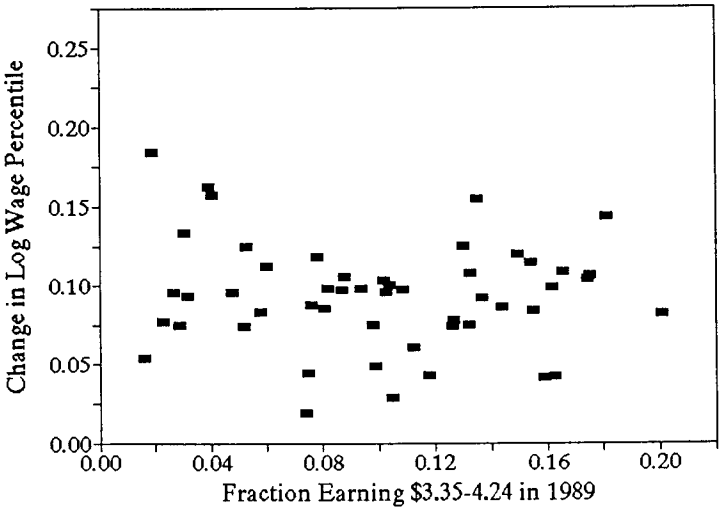


Figure 6, continued

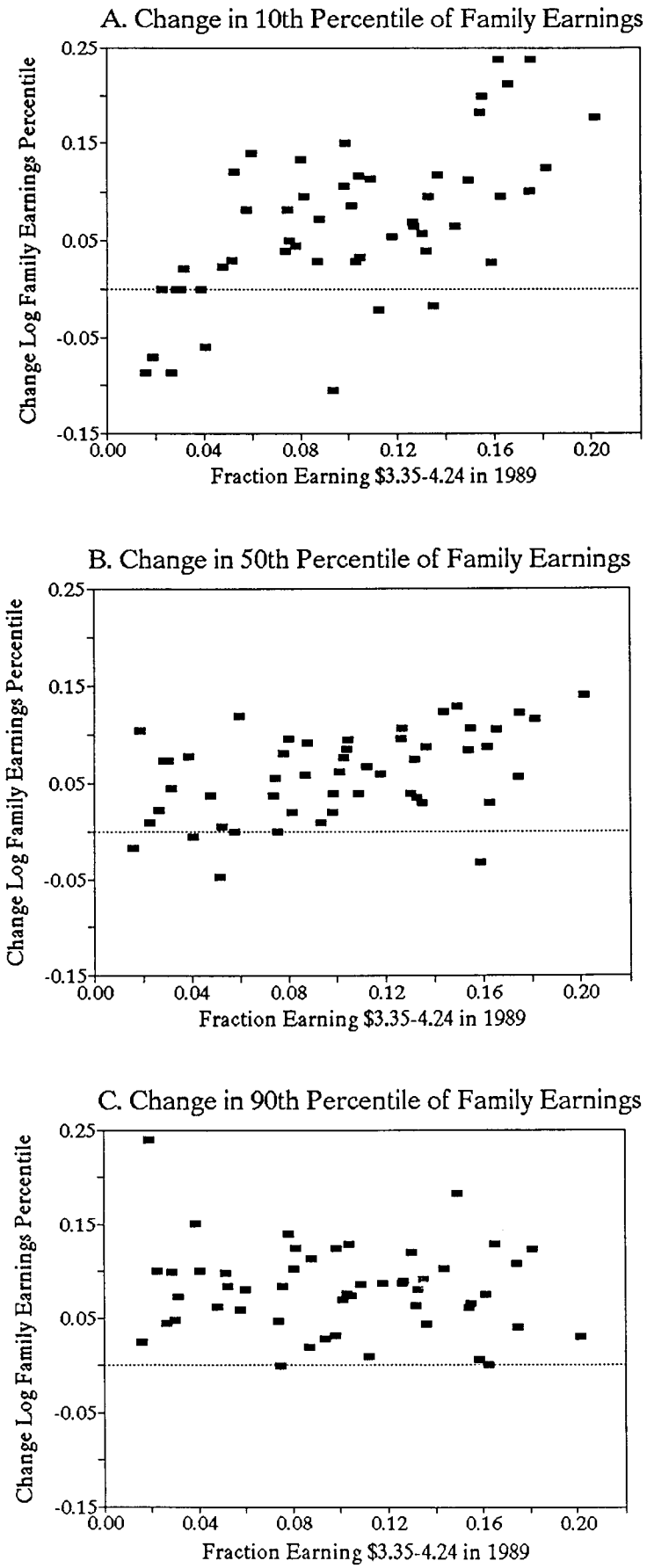


Figure 7: Changes in Percentiles of Family Earnings Across States, 1989-1991