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Raising the Minimum Wage:
Another Empty Promise to the Working Poor

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Overview

This paper provides a historical view of the effect of increases in the federal minimum wage on the working poor with a particular focus on the past 15 years. Since its inception in 1938, increases in the federal minimum wage have become an increasingly weak mechanism for addressing the problem of poverty in America. This continuing deterioration stems from the fact that fewer low-wage employees are supporting a family on a minimum wage income. As poverty becomes more a problem of hours worked and not an individual's wage level, anti-poverty policies that focus on wages will be less efficient than polices that focus on income, such as the Earned Income Tax Credit (EITC).

Wages vs. Income

While wages and income are certainly related, the connection between the two has always been tenuous. In 1946, Nobel prize-winning economist George Stigler commented, "the connection between hourly wages and the standard of living of a family is remote and fuzzy." As this study shows, the fuzzy connection in 1946 has become blurrier over time.

Examining Census Bureau data since 1939, the authors found that fewer low-wage employees live in poor households today than in years past. Specifically, in 1939, 85 percent of low-wage employees[1] were living in poor households. By 2003, only 17 percent of low-wage employees were living in poor households. Consequently, attempting to target poor families by manipulating wages is an inefficient means of addressing the problem.

Even more important than the number of low-wage employees living in poor households is the number of low-wage employees who are the heads of poor households. This stereotypical beneficiary of an increase in the wage floor is the one supporters of minimum wage increases claim represents the typical minimum wage employee. In reality, a small fraction of low-wage employees are the head of a poor household, and this number has decreased significantly over time. In 1939, nearly one-third (31%) of all low-wage employees were the heads of a poor household. By 2003, only 9 percent of low-wage employees were heading a poor household.

These statistics all reveal an underlying point—modern families have multiple workers whose collective earnings make up the family income. Federal anti-poverty policy should adjust accordingly. As more women and teenagers have entered the workforce as second and third earners, the ranks of low-wage employees contain fewer individuals single-handedly supporting a family.

Federal Minimum Wage Increases and Poverty

A byproduct of the aforementioned changes in the composition of family incomes is that the poor make up a small percentage of beneficiaries from a wage hike. Contrary to popular perception, the average minimum wage employee is not in poverty or raising a family on a mini-

mum wage income. Analyzing Census data, the authors found that a beneficiary from a proposed federal minimum wage hike to $7.25 an hour is far more likely to be in a family earning more than three times the poverty line than in a poor family. In total, only 12.7 percent of the benefits from a federal minimum wage increase to $7.25 an hour would go to poor families. In contrast, 63 percent of benefits would go to families earning more than twice the poverty line and 42 percent would go to families earning more than three times the poverty line. The average benefit per household is approximately the same, with poor families receiving a benefit of $1,110 and families earning three times the poverty line earning $1,090—nearly the same benefit, despite a vast difference in family incomes.

While there is strong empirical evidence to suggest that increasing the minimum wage will have adverse employment effects—particularly among young African Americans, young non-high school graduates, and teenagers—the authors assume no disemployment effects associated with the minimum wage hike so as to allow the policy its best chance to achieve the poverty-reducing goals promised by its proponents. While the minimum wage is often promoted as a policy designed to help the poor, minorities, and single mothers, this analysis reveals that only 3.7 percent of the benefits from a $7.25 an hour federal minimum wage would go to poor African-American families. Only 3.8 percent would go to poor single-mother households. Even more troubling, the majority of "working poor" families—families who are working but remain in poverty—receive no benefit from an increase to $7.25 an hour. These families don't benefit because they already earn more than the new federal minimum wage and remain in poverty either because of a low number of hours worked or a large family size. Many of these individuals would benefit far more from an increase in the generosity of federal and state EITC programs.

Work Effort and Poverty

Examining the hours worked by poor employees reveals that increases in work effort could have a significant effect on income. The authors found that the median wage of the highest earner in a poor household was much higher than the proposed federal minimum wage—$9.25 for poor households and $9.60 for poor and near-poor households (up to 150 percent of the poverty line). While this wage should be sufficient to put a family of four out of poverty (even without a second or even third earner), the data reveal that the majority of these individuals are not working full-time.

The median hours worked for the highest earner in a poor family in 2003 was 1,720—significantly less than full time (2,080 hours a year). While including near-poor families in the calculation brings this number up to 1,872 hours, the majority of these individuals are still working less than full time at their current wage. These individuals would receive significantly more benefit from programs that promote increased work effort than they ever would from a minimum wage increase.

Single Mothers and the Minimum Wage

Advocates of increasing the federal minimum wage often insinuate that primary beneficiaries will be single mothers raising a family on a minimum wage income. As was mentioned above, only 3.8 percent of the benefits from an increase to $7.25 an hour accrue to poor single mothers. One of the factors causing this low percentage of benefits is the fact that the majority of poor single mothers (58%) have hourly wages above this level. In addition, only 18.5 percent of the benefits going to single mothers will go to those in poverty. The majority of benefits going to single mothers will go to those earning more than twice the poverty line.

Senator Edward Kennedy (D-MA), the primary sponsor of a federal minimum wage increase to $7.25 an hour, recently stated in support of an increase that "the jobs available to women leaving welfare are often minimum wage jobs." Census data, however, shows this is not the case. From 1995–2000, the time period following welfare reform, the employment rate of single mothers increased by 10.8 percentage points. Many of these single mothers were undoubtedly leaving the welfare rolls and joining the workforce. If Sen. Kennedy's claim is correct, one would expect a significant increase in the number of single mothers holding low-wage or federal minimum wage jobs. In reality, 77 percent of the increase in employment was accounted for by single mothers holding jobs paying more than low wages (50 percent of the average private sector hourly wage rate).

Examining the period over the 1990's business cycle produces similar results. The employment rate of single mothers increased by 14 percentage points, with 64 percent of this increase accounted for by single mothers earning more than low wages. Only 24 percent of the increase can be accounted for by those who held jobs at the prevailing federal minimum wage rate.

Conclusion

The authors calculate that, absent any employment loss, the cost to employers of the proposed increase in the federal minimum wage to $7.25 an hour will be $18.26 billion. Only 12.7 percent ($2.3 billion) of this cost will actually go to poor families, with only 3.7 percent going to poor African-American families. The ability of the minimum wage to target poor families is weaker and decreasing over time. Contrary to the statements of its advocates, fewer and fewer low-wage employees are supporting a family on the minimum wage, with only 9 percent of low-wage employees actually supporting a poor family.

Therefore, effective anti-poverty programs must concentrate on family income and not wages. While most working poor families will not receive any benefit from an increase in the federal minimum wage to $7.25 an hour, the vast majority would receive a benefit from increases in the generosity of federal and state EITC programs. These programs provide targeted assistance to the low-income working families so often cited in support of minimum wage increases—the same families that receive a minority of the benefits from a wage increase.

[1]For the purposes of this study, a low-wage employee is anyone earning less than 50 percent of the average private sector wage.

Raising the Minimum Wage: Another Empty Promise to the Working Poor

I. Overview

> *"It's time to honor and reward people who work hard and play by the rules. ... No one who works full time and has children should be poor any more."*
>
> —Bill Clinton and Al Gore, 1992

Minimum wage increases are supported by those who want to ensure that no one who works hard and plays by the rules lives in poverty. But who really gains from a minimum wage increase? How many of the working poor are actually helped? And are there more effective means of achieving this social goal?

This paper provides a historical view of the effectiveness of Federal minimum wage increases in raising the wages of the working poor, focusing specifically on the 1990s. Despite the recent increase in the employment of single mothers, which reversed the long-term decline in the share of low-wage workers who were heads of households, a Federal minimum wage increase (from $5.15 to $7.25 per hour) along the lines proposed by Senator Edward Kennedy (D-MA) will once again promise much more than it will deliver to the working poor. This mandated wage increase will be an even less target-efficient mechanism for improving the economic well-being of the working poor than was the last federal minimum wage increase (from $4.25 per hour to $5.15 per hour), which was signed into law by President Clinton in 1996. Relative to the 1996 increase, the current proposal, if enacted, will result in an even greater share of its mandated wage gains going to workers who live in higher income households while once again failing to help the vast majority of workers who are poor.

We focus on the growing population of working single mothers (defined as single-female heads of households who work at least 14 hours a week and at least 15 weeks per year and have children under age 18) because it is argued that the growth in their number among the working poor or near-poor has made it even more important to increase the Federal minimum wage. By examining the population of working single mothers before and after the passage of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA), we show that despite political rhetoric to the contrary, the majority of the jobs held by single mothers who live in poor or near-poor households pay an hourly wage that already exceeds $7.25 per hour and hence will not be helped by the proposed increase in the Federal minimum wage. We also show that the vast majority of workers who will gain do not live in poverty.

The welfare reforms of 1996, together with other pro-work policies of the 1990s, shifted federal social welfare policy away from programs that discouraged single mothers from working to those that encouraged work. Chief among these was a substantial increase in the Earned Income Tax Credit (EITC), enacted in 1993 but only fully implemented in 1996.[1] Because the EITC targets workers—especially single working mothers—who live in low-income households, rather than low-wage workers regardless of their household's income, the EITC is far more effective in helping the working poor in general and single working mothers in particular than are minimum wage increases. The EITC has not only increased the after-tax wage earnings of workers in low-income households but is a major reason for the dramatic increase in the employ-

ment of former welfare mothers. A further increase in the EITC is a far more effective mechanism for increasing both the employment and income of single mothers than is a further increase in the federal minimum wage. (See: Hotz and Scholz, 2003 for a review of the EITC literature; Burkhauser, Couch and Glenn, 1996 and Neumark and Wascher, 2001 for measures of its target effectiveness relative to minimum wage increases.)

II. Minimum Wage Law and the Working Poor

The federal minimum wage was enacted as part of the Fair Labor Standards Act of 1938 (FLSA). President Roosevelt rallied Congressional support for this legislation with the promise that it would help the one-third of Americans who were "ill-housed, ill-clad, and ill-nourished" (Roosevelt, 1937). This ringing call for social action still echoes in the words of modern-day minimum wage supporters. In his 1995 State of the Union address, President Clinton declared:

> *"I've studied the arguments and the evidence for and against a minimum wage increase. I believe that the weight of the evidence is that a modest increase does not cost jobs, and may even lure people into the job market. But the most important thing is, you can't make a living on $4.25 an hour."*
>
> —Clinton, 1995

Making a similar argument nine years later, Senator Kennedy stated:

> *"[T]he jobs available to women leaving welfare are often minimum wage jobs, and it is difficult, if not impossible, for them to meet the needs of their families and raise their children. Daily life is often harsh for low-income working mothers in all parts of the country, whether or not they have been on welfare. For them, survival is the daily goal. If they work hard enough and their working hours are long enough, they can make ends meet—but only barely. … We must stop asking these families to do it all alone. They are working too many hours for too little pay, without access to the support they need to make ends meet and improve the quality of their lives. One of the most important steps we can take is to guarantee a fair minimum wage."*
>
> —Kennedy, 2004

While the social justice concerns raised by modern supporters of the minimum wage continue to appeal to the vast majority of Americans—who believe that those who work hard and play by the rules should not live in poverty—over the years minimum wage increases have in fact become a weaker and weaker mechanism for achieving this goal.

Current popular support for the minimum wage is based on legal and political precedents set during the first part of the 20th Century (Burkhauser, Couch, and Glenn, 1996). During the 19th and early 20th Centuries, the right to contract was guaranteed under the 14th Amendment to the Constitution, and legislatures could only intervene in the labor market under narrow circumstances (*Lochner v. New York*, 198 U.S. 45 (1905)). However, by 1937, the Supreme Court upheld a state minimum wage law (for women), stating that "the legislature was entitled to adopt measures to reduce the evils of the 'sweating system,' the exploiting of workers at wages so low as to be insufficient to meet the bare cost of living …" (*West Coast Hotel Co. v. Parish*, 300 U.S. 379

(1937)). This decision paved the way for state intervention in the marketplace to correct social inequities.

While the right of States or the Federal Government to use minimum wage increases to help the working poor is now fully established, the effectiveness of minimum wage laws in achieving this goal is not. Stigler (1946), in his seminal article on this topic, formalized two critiques of the minimum wage. First, the impact of raising the minimum wage on the working poor was uncertain. While those workers who kept their jobs and worked the same number hours would see their labor earnings rise, those workers who lost their jobs or had their hours reduced would be harmed. In our analysis, we assume that there are no employment effects associated with an increase in the minimum wage. Hence, our simulations estimate the impact of a minimum wage increase assuming no change in hours worked. (We will discuss this in more detail in Section III.)

Second, Stigler pointed out:

> *"The connection between hourly wages and the standard of living of a family is remote and fuzzy. Unless the minimum wage varies with the amount of employment, number of earners, non-wage income, family size, and many other factors, it will be an inept device for combating poverty even for those who succeed in retaining employment."*
>
> —Stigler, 1946, p. 363

Stigler's second insight is the motivation for our work. Household income depends on factors beyond an individual worker's wage rate. It depends on the number of hours the person works, the number of workers in the household, their wages and hours worked as well as on income from other sources. As Burkhauser, Couch, and Glenn (1996, p. 67) note, "poverty is gauged by looking at household circumstances, not the earnings of each individual in isolation."

III. The Minimum Wage and Employment

Until the 1990s, a consensus existed among economists that raising the minimum wage caused net employment losses. Wessels (1980); Brown, Gilroy, and Kohen (1982); and Brown (1988) provide reviews of the pre-1992 literature on the minimum wage. Brown (1988) summarizes this literature by concluding that a 10 percent increase in the minimum wage was associated with a 1 to 3 percent reduction in teenage employment (a common indicator of entry-level employment). But in the 1990s, four influential articles argued that minimum wage increases had an insignificant and negative effect or even a significant and positive effect on employment (Katz and Krueger, 1992; Card, 1992a; Card, 1992b; and Card and Krueger, 1994). These studies, together with Card and Krueger (1995), fundamentally challenged the previous consensus, and provided the intellectual underpinnings of President Clinton's 1995 statement that "a modest increase [in the minimum wage] does not cut jobs, and may even lure people into the job market" (Clinton, 1995).

An additional decade of research has discounted the notion that minimum wage increases have positive employment effects and a near consensus has returned to the view that minimum wage increases have significant but relative modest negative effects on the employment of teenagers and other low-skill groups. (See: Abowd, Kramarz, Lemieux and Margolis, 2004; Burkhauser, Couch, and Wittenburg, 2000; Deere, Murphy, and Welch, 1995; Neumark and Wascher, 1994, 2000, 2002, 2004.) Public opinion surveys conducted in 1996 reveal that the median labor economist reported that a 10-percent increase in the minimum wage would

result in a 1-percent decline in the employment of teenagers, consistent with the findings in Brown, Curtis, and Kohen (1983) (Fuchs, Krueger, and Poterba, 1998).

Based on this more recent research, our assumption of no change in the employment or hours of work will, if anything, overstate the gains to low-wage workers from a minimum wage increase.

IV. Low Wages and Poverty

Between 1939 and 2003, the federal minimum wage has fluctuated between 34 and 56 percent of the average private sector wage, defined as the gross average hourly earnings of all production and non-supervisory workers in the private nonfarm sector, based on payroll data reported by employers to the Bureau of Labor Statistics (Burkhauser, Couch, and Glenn, 1996). In 2003, the federal minimum wage was at a historic low (33.6 percent) as a percentage of the average private sector wage.[2,3] Advocates of the minimum wage have generally proposed increases in the minimum wage to around 50 percent of this average.[4] It is this group of low-wage workers (those who earn wages of 50 percent or below the average) on whom we focus in this section.

Early in the 20th Century, the relationship between low wages and low household income was strong, since most households had only one worker and such households could count on few social programs to supplement their wages. However, at the start of the 21st Century, the relationship between being a low-wage worker and living in a poor or near-poor household is even fuzzier than in Stigler's day.

Table 1 builds on the work of Burkhauser, Couch, and Glenn (1996), and Burkhauser and Finegan (1989). It shows how the distribution of low-wage workers over the income distribution has changed since 1939. As in Burkhauser, Couch, and Glenn (1996), we define a low-wage worker as one whose wages fall below 50 percent of the average private sector wage.[5]

The income-to-needs ratio is our measure of economic well-being for these workers. For the years 1949 to 2003, this is defined as the ratio of total household income to the official U.S. Census-determined poverty line, adjusted for household size.[6] So, for example, in 2003, the poverty line for a household of four was $18,810. Therefore, a worker living in a household with four members whose total household income was $37,620 would have an income-to-needs ratio of 2.0. Importantly, we use household income because a worker is not an independent entity with respect to his or her economic well-being. A worker lives in a household and it is the total income of that household, not the worker's wage rate or labor earnings, that affects his or her economic well-being.[7]

Table 1 shows a relatively close relationship between being a low-wage worker and living in poverty in 1939. One reason is that a large share (34 percent) of low-wage workers are household heads (defined here as the head of a household with more than one person) and most (94 percent) headed poor households, so that 31 percent of low-wage workers are poor household heads. Another reason is that households with low-wage workers had fewer other sources of income. So even when low-wage workers are not household heads, they are still likely (85 percent) to live in a poor household. Hence, in 1939, just after the passage of the FLSA, when no other mechanisms for helping the working poor existed, a minimum wage (assuming no negative employment effects) was a relatively target-efficient mechanism for helping the working poor since a large share of low-wage workers lived in poor households.

This relationship between being a low wage worker, especially if one were a household head, and living in a poor household declined steadily over the next 40 years. Hence by 1979

Table 1 The Distribution of Low-wage Workers Across the Income Distribution: 1939–2003 (percentages)

	1939[a]		1949[b]		1959		1969		1979	
Income-to-Needs Ratio	Heads of Household	All Workers	Heads of Household	All Workers	Heads of Household	All Workers	Heads of Household	All Workers	Heads of Household	All Workers
Less than 1.00 (poor)	94	85	77	NA	61	42	45	23	37	20
1.00 to 1.24	3	5	8	NA	11	10	13	9	13	7
1.25 to 1.49	2	3	5	NA	7	10	9	7	9	7
1.50 to 1.99	1	4	6	NA	8	12	11	14	13	12
2.00 to 2.99	0	2	3	NA	9	16	13	20	16	20
3.00 or above	0	0	1	NA	4	10	10	27	12	34
Total	100	100	100	NA	100	100	100	100	100	100
Percent of all low-wage workers who were heads of:										
households	34	–	31	–	29	--	25	--	21	--
poor households	31	–	24	–	18	–	11	--	8	--

	1989		1995		2000		2003	
Less than 1.00 (poor)	37	22	33	14	33	16	31	17
1.00 to 1.24	13	9	11	7	9	6	10	7
1.25 to 1.49	10	8	8	8	7	7	8	8
1.50 to 1.99	12	12	15	14	10	12	13	13
2.00 to 2.99	15	19	16	22	18	22	17	22
3.00 or above	13	30	18	35	21	37	21	34
Total	100	100	100	100	100	100	100	100
Percent of all low-wage workers who were heads of:								
households	22	--	25	--	27	–	29	--
poor households	7	--	8	--	8	–	9	--

Notes:

[a] Income-to-needs ratio in 1939 excludes income from sources other than wages and salaries.

[b] Data for 1949 are not entirely comparable due to different sampling procedures. Data for all workers and other household members are not available.

[c] Working head-of-households is defined as heads under age 65 in households of size greater than one. Low-wage workers earned less than half of the average private sector wage. Poverty levels for 1939, 1949 and 1959 were formed by extrapolation using the Consumer Price Index. Details may not sum to 100 due to rounding.

[d] Tabulations include all workers aged 17 to 64, whether living alone or in households. The former are classified by the ratio of total personal income to the poverty level for one-person households; workers in households are classified by the ratio of total household income to the size-adjusted poverty level for their household. Comparable data were not gathered in the 1950 census.

Source: Update and compilation of tables from Burkhauser and Finegan (1989) and Burkhauser, Couch, and Glenn (1996).

only 21 percent of low wage workers were household heads and only 8 percent of all low wage workers were poor household heads.All other low-wage workers were either not household heads or did not live in poor households. These numbers remained about the same over the next 10 years.

Hence, between 1939 and 1989 the relationship between earning a low wage and living in poverty became weaker and weaker as low-wage workers increasingly became second or even third workers in non-poor households. Even when they headed households, the labor earnings of other household members, as well as the income from other household sources, usually pushed their household's income above the poverty line. Hence, minimum wage increases that once could be expected to primarily benefit the working poor became less and less likely to do so.

The long term decline in the share of low-wage workers who were heads of households ended in the 1990s. In 1989, 22 percent of low-wage workers were household heads. By 1995 this share had grown to 25 percent. By 2003, it was up to 29 percent, a share not seen since 1959. But importantly, while the share of low-wage workers who are household heads returned to 1959 levels, the share of low-wage workers who are poor household heads did not. In 1959, 18 percent of low-wage workers were poor household heads. In 2003, only 9 percent of low-wage workers were poor household heads. The reason is that in 1959 61 percent of low-wage household heads lived in poor households. In 2003, 31 percent did so.[8]

V. Low-wage Workers and Single Mothers

Table 2 separates the overall increase of 6.8 percentage points (29.1 minus 22.3) in the share of household heads in the low-wage population between 1989 and 2003 into two parts—the percentage point increase caused by the increase in the share of low-wage earning single mothers and the increase in the share of low-wage earners among other types of household heads. The growth is almost equally divided between the two (3.1 and 3.7 percentage points, respectively). The share of low-wage earners who were single mothers rose from 4.9 percent in 1989 to 8.0 percent in 2003. More troubling, Table 3 shows that almost the entire increase in the share of poor low-wage workers who are household heads (1.6 out of 1.8 percentage points) came from the growth in the share of low-wage workers who are single mothers. Their share increased from 2.9 percent in 1989 to 4.5 percent in 2003.

While this increase in the share of poor working household heads who are single mothers is a cause for concern, it must be put into perspective. Table 4 shows that the increase is not caused by an increase in the poverty rate of low-wage single mothers. That rate fell slightly over the period, from 59.5 percent in 1989 to 57.2 percent in 2003. It continues to be the case that a single mother who does not work is far more likely to be in poverty than a single mother who works at a low-wage job (71.9 percent versus 57.2 percent in 2003). Work clearly reduces poverty. The overall poverty rate of all single mothers who work (19.9 percent in 2003), while higher than that of other working heads of households (3.3 percent), is far lower than the poverty rate of single mothers who do not work.

As we will see, it is the dramatic increase in the employment rate of single mothers in the 1990s that is driving their increasing shares in both the low-wage and the higher-wage working populations. Furthermore, as is shown in Table 1, it is still the case that the vast majority of low-wage workers are not household heads (only 29 percent of low-wage workers were household heads in 2003), and an even larger majority are not poor household heads (only

Table 2	Composition of Low-wage Worker Population by Household Type: 1989–2003 (percentages)				
Household Type	1989	1995	2000	2003	Change 1989–2003
All Heads	22.3	24.9	26.8	29.1	6.8
Single Mothers	4.9	6.1	6.9	8.0	3.1
Not Single Mothers	17.4	18.8	19.9	21.1	3.7
Not Household Heads	77.7	75.1	73.2	70.9	-6.8
Total	100.0	100.0	100.0	100.0	–

Source: March Current Population Survey, 1990, 1996, 2001, and 2004.

Table 3	Composition of Low-wage Workers Who Are and Are Not Poor Heads of Household: 1989–2003 (percentages)				
Household Type	1989	1995	2000	2003	Change 1989–2003
All Poor Heads	7.1	7.6	7.9	8.9	1.8
Single Mothers	2.9	3.2	4.1	4.5	1.6
Not Single Mothers	4.2	4.4	3.8	4.4	0.2
Not Poor Household Heads	92.9	92.3	82.1	91.1	-1.8
Total	100.0	100.0	100.0	100.0	–

Source: March Current Population Survey, 1990, 1996, 2001, and 2004.

Table 4	Poverty Rates of Low-wage Household Heads: 1989–2003 (percentages)			
	1989	1995	2000	2003
All Single Mothers	41.4	38.2	32.1	32.1
Single Mothers Working	19.8	19.6	21.6	19.9
Single Mothers Earning Low Wages	59.5	53.7	60.0	57.2
Single Mothers Not Working	82.7	75.6	72.5	71.9
All Other Household Heads	6.6	7.3	6.4	6.7
Other Household Heads Working	3.5	3.6	3.2	3.3
Other Household Heads Earning Low Wages	24.8	23.5	19.4	21.1
Other Household Heads Not Working	26.4	23.0	19.5	19.5
All Household Heads	10.5	11.2	9.3	10.2
All Household Heads Working	5.0	5.3	5.4	5.5
All Household Heads Earning Low Wages	32.5	30.8	29.9	31.0
All Household Heads Not Working	41.6	35.0	26.5	27.5

Source: March Current Population Survey, 1990, 1996, 2001, and 2004.

8.9 percent of low-wage workers were poor household heads in 2003). Thus, despite the increase in the share of single mothers in the low-wage population in the 1990s, the overwhelming majority of low-wage workers continue to be neither household heads nor poor.

Even though single mothers continue to make up a small percentage of the low-wage worker population, it is nonetheless important to understand why their share in this population has grown since 1989. If it were the case, for instance, that "the jobs available to women leaving welfare are often minimum wage jobs," as Senator Kennedy argues, then perhaps the dramatic increase in the employment rate of single mothers will make minimum wage increases more target-efficient today than was the case when Burkhauser *et al*. (1996) did their evaluation of the 1990 minimum wage increase to $4.35 per hour. But do working single mothers hold predominately minimum wage or even low-wage jobs?

Single mothers play a small but important role in the low-wage labor market, and the low-wage labor market plays a small but important role in the entire United States labor market. To more fully understand what happened to both low-wage single mothers in particular and low-wage workers in general over the 1990s, it is useful to observe what happened to all households over this period.

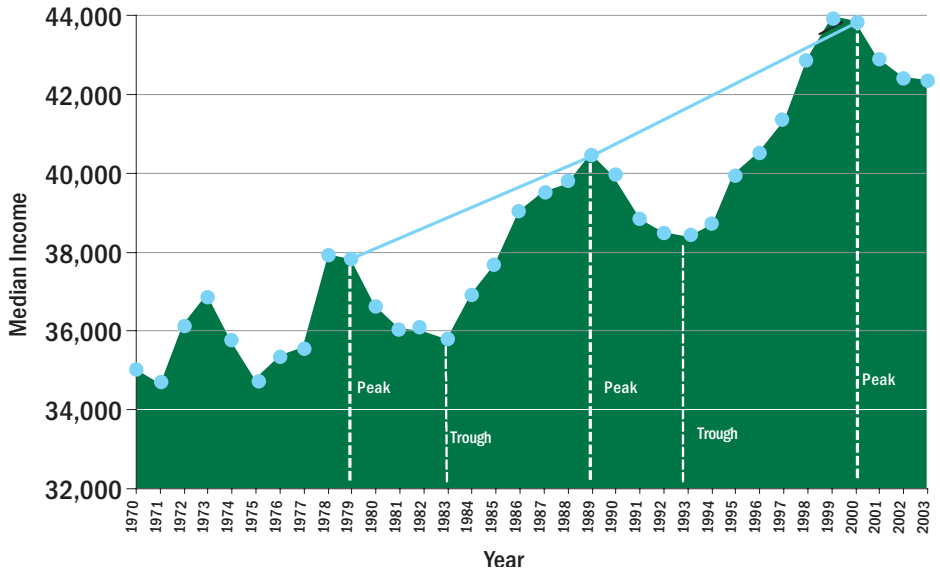
Figure 1 shows how median household income, adjusted for inflation, has changed in the United States since 1970. While there was substantial growth in median household income between 1970 and 2003, median household income fluctuated widely within business cycles over that period. One can roughly divide the last two business cycles of the 20th Century (as defined by peaks in median household income) as 1979–1989 and 1989–2000.

Figure 2 shows how the official U.S. Census poverty rate varied over these same years. Yearly poverty rates closely track the business cycle, rising and falling with median and real income. Figure 2 shows that not only did real median income increase between 1989 and 2000, but poverty rates also fell between these two business cycle peaks.

Burkhauser, Couch, Houtenville, and Rovba (2005) show—using these years as approximations of the 1980s and 1990s business cycles—that economic growth over the 1990s business cycle was more equally shared across the income distribution than was the case over the 1980s business cycle. They found that the income of vulnerable populations that had not shared in the economic growth of the 1980s, including single mothers and those households receiving federal welfare benefits, substantially increased in the 1990s. How does this increase in the economic well-being of single mothers square with the increase in their share of all low-wage workers?

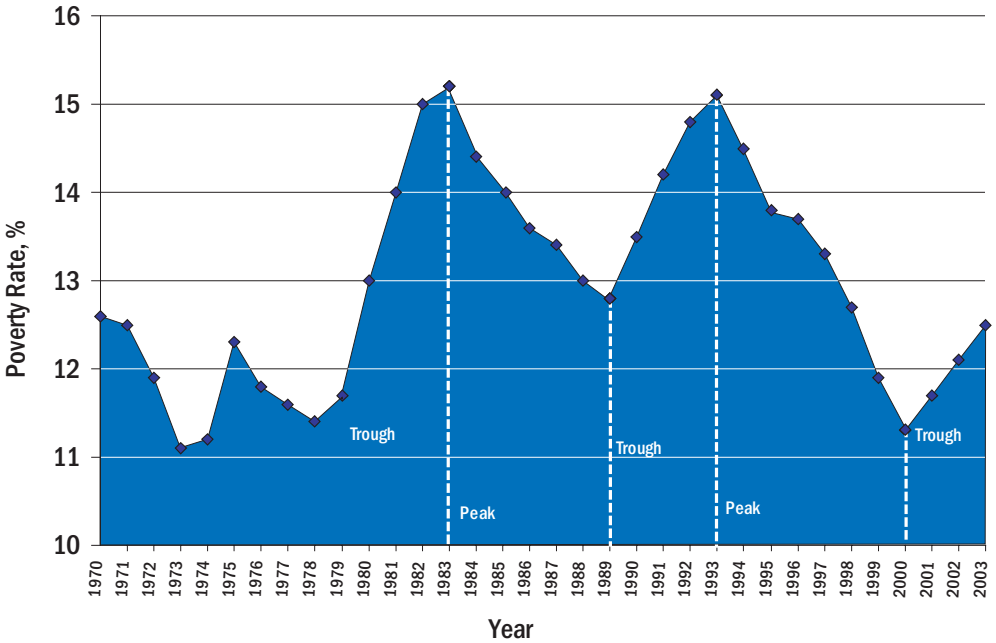
As we saw in Table 2, the share of low-wage workers who were single mothers increased from 4.9 percent to 6.9 percent over the business cycle of the 1990s and continued to increase thereafter, reaching 8.0 percent in 2003. Row 1 of Table 5 reports these values. Row 2 shows that a major part of the reason for the rise in the share of single mothers in this population is that the share of single mothers in the labor force increased dramatically over this period. In 1989 it was 9.4 percent. By 2000 it was 11.8 percent. In 2003, despite three years of slow economic growth, it increased to 12.9 percent. This was not primarily because the share of single mothers in the population increased (row 3) but rather because of the explosion in the employment rate of single mothers over this period, especially after welfare reform in 1996. Row 4 shows that the employment rate of single mothers was 65.9 percent in 1989. It grew to 69.1 percent in 1995 before leaping to 79.9 percent in 2000 and then falling slightly to 76.8 percent in 2003.[9]

Figure 1. Real Median Household Income in the United States: Total Population, 1970–2003 (in 2002 dollars)



Source: U.S. Bureau of the Census based on yearly values from March Current Population Surveys.

Figure 2. Poverty Rate in the United States: Total Population, 1970 to 2003



Source: U.S. Bureau of the Census based on yearly values from March Current Population Surveys.

Table 5	Composition and Employment of Single Mothers and Low-wage Workers: 1989–2004 (percentages)			
Low-wage Worker Groups	**1989**	**1995**	**2000**	**2003**
Single Mothers in Low-wage Population	4.9	6.1	6.9	8.0
Working Household Heads Who Are Single Mothers	9.4	11.0	11.8	12.9
Single Mothers in the Population	4.1	4.5	4.1	4.8
Employment of Single Mothers	65.9	69.1	79.9	76.8
Working Single Mothers Who Earn Low Wages	23.9	26.3	25.9	24.0
All Workers Who Earn Low Wages	18.3	18.6	16.6	16.7

Source: March Current Population Survey, 1990, 1996, 2001, and 2004.

Importantly, it is the increase in the employment rate of single mothers rather than a dramatic downward shift in their wage earnings that is driving the increase in the share of single mothers in the low-wage population observed in row 1. As can be seen in row 5, while the percentage of single mothers who earned low wages increased between 1989 and 1995, it actually declined slightly thereafter, so that the increase in the share of single mothers holding low-wage jobs only grew from 23.9 percent to 25.9 percent over the 1990s business cycle and was 24.0 percent in 2003. Pro-work welfare reform policies, along with a strong economy, dramatically increased the employment of single mothers and hence their shares in both the low-and non-low-wage population of workers. (See Blank, 2002 for a review of the literature on the impact of 1996 welfare reforms on employment of single mothers.) Finally, as can be seen in row 6, the strong economic growth of the 1990s also reduced the percentage of all workers who earned low-wages over this period (from 18.3 in 1989 to 16.6 percent in 2000), which further increased the importance of single mothers as a share of the remaining workers in low-wage jobs.

In Table 6, we more carefully look at the distribution, of single mothers across the wage distribution and thus more carefully consider the argument that single mothers "often move into minimum wage jobs." In so doing, we once again choose the years 1989, 1995, 2000, and 2003. These are particularly useful years to compare with respect to the expected consequences of a federal minimum wage increase on single mothers. The year 1989 preceded the federal minimum wage increases in 1990, and the year 1995 preceded the federal minimum wage increase of 1996. The years 1989 and 2000 are the peak years of the 1990s business cycle, and 2003 is the most recent year of our data and reflects the decline in the economy since 2000.

Table 6, row 1 shows the dramatic decline in the percentage of single mothers not working over the period but especially following welfare reform in 1996. In 1989, 34.1 percent of single mothers did not work. This fell to 30.9 percent by 1995, a decrease of 3.2 percentage points. Between 1995 and 2000, the non-working single mother population fell by 10.8 percentage points. While some of that gain in jobs was lost as the United States moved into recession, in 2003 the non-working percentage of 23.2 was still far below the 1995 level.

How did the number of single mothers change across the wage distribution over this period? First, the vast majority of single mothers did not and do not hold minimum wage jobs or even low-wage jobs. This was true in 1989, just before the minimum wage increase of 1990, when only 6.2 percent of single mothers held minimum wage jobs of $3.45 per hour and another 9.0 percent held low-wage jobs. The majority, 50.9 percent, held jobs that paid more than 50 percent of the average private sector wage rate. It remained true over all the other years reported in Table 6. But how did the share of all single mothers in each of our wage rate groups change over the period? Between 1989 and 1995 most of the gain in employment of single mothers can be accounted for by an increase in the minimum wage and low-wage categories. But this is not the case between 1995 and 2000. In 1995, just prior to the federal minimum wage increase from $4.25 to $5.15 per hour, 8.1 percent of single mothers held minimum wage jobs of $4.25. In 2000, 9.5 percent of the single mothers held minimum wage jobs of $5.15 per hour. This was an increase of 1.4 percentage points (row 2, column 5). As row 3, column 5 shows, there was another 1.1 percentage point increase in single mothers who held low-wage jobs above $5.15 per hour. But the greatest increase between 1995 and 2000 (row 4, column 5) was in single mothers who held jobs above 50 percent of the average private sector wage rate—8.3 percentage points. So of the 10.8 percentage point gain in employment of single mothers between 1995

Table 6	Percentage of Single Mothers in Various Hourly Wage Rate Categories						
Hourly Wage Rate Categories	1989	1995	1989–1995	2000	1995–2000	2003	2000–2003
Not working[a]	34.1	30.9	3.2	20.1	10.8	23.2	+4.1
Earning the federal minimum wage[b]	6.2	8.1	1.9	9.5	1.4	9.0	-0.5
Earning a low wage greater than federal minimum[c]	9.0	9.5	0.5	10.6	1.1	15.0	+4.4
Earning more than a low wage[d]	50.9	51.5	0.6	59.8	8.3	52.8	-7.0

Notes:

a Not working at least 14 weeks last year at an average of 15 hours/week.

b Earning $3.35 or less in 1989, $4.25 or less in 1995, and $5.15 or less in 2000 and 2003.

c The percentages of those "earning the Federal minimum wage" are calculated under the assumption that those earning less than the Federal minimum wage are minimum wage earners. That is, it assumes that all employment is covered under the Federal law. Therefore, the percentage can be interpreted as an upper-bound estimate. A low wage is defined as one-half of the average private sector wage rate.

d Greater than one-half the average private section wage.

Source: March Current Population Survey, 1990, 1996, 2000, and 2004.

and 2000, 8.3 percentage points (77 percent) was accounted for by an increase in single mothers holding jobs paying more than 50 percent of the average private sector hourly wage rate. These gains were caused by rapid economic growth over the period, and welfare reforms that encouraged welfare mothers to work. It is unlikely that increases in the minimum wage in 1996 played any role in helping the vast majority of single mothers, since they already held jobs that paid in excess of the new federal minimum wage. These above minimum wage jobs were earned in the marketplace without government intervention. Between 2000 and 2003, 3.1 percent more single mothers did not work, but the vast majority of jobs gained since 1995 remain those that pay more than the federal minimum.

The employment rate of single mothers increased by 14.0 percentage points over the business cycle of the 1990s. Fully 64 percent (8.9 percentage points) of the increase in the share of single women who work can be accounted for by the increase in jobs that paid more than 50 percent of average wages. Another 12 percent (1.6 percentage points) can be accounted for by the increase in jobs that paid more than the prevailing federal minimum wage but less than 50 percent of the average wage. Only 24 percent (3.3 percentage points) can be accounted for by those who held jobs at the prevailing minimum wage, despite the fact that the minimum wage was increased twice over the period—from $3.35 to $4.25, and to $5.15 per hour.[10]

VI. Who Gains from Minimum Wage Increases?

We examine who gained from the 1996 increase in the federal minimum wage to $5.15 per hour and who will gain from the proposed minimum wage increase to $7.25 per hour by using a sample of workers aged 17 to 64 taken from the March 1996 and the March 2004 CPS. Wage data is used from the outgoing rotation groups, which include information on workers' usual gross weekly earnings in their primary job and the number of hours per week they usually work in that job.[11]

Table 7 compares poor and near-poor households prior to the actual minimum wage increases in 1989, 1995, and 2003.[12] As can be seen from the first two rows, the share of poor or near-poor households that have at least one worker fell slightly between 1989 and 1995, but in 2003 this share was greater than in 1989. Hence, other things being equal, a greater share of poor families could be helped by work-based programs like the minimum wage or the EITC.

As can be seen in the next three rows of Table 7, however, the vast majority of workers who live in or near poverty levels earned wages above the proposed minimum in the year before enactment and hence were not helped by the subsequent minimum wage increases in 1990 and 1996. The story is the same for the latest proposal to raise the federal minimum. While the share of working poor households that could be helped increased substantially between 1989 and 2003 (from 16.9 percent of working poor households in 1989 to 26.2 percent in 1995, and to 29.3 percent in 2003), a minimum wage increase to $7.25 per hour will still provide no help for the vast majority of the working poor. The same is true if we look at those who are either in or near poverty.

As the final three rows of Table 7 show, the median wage of the highest earner in a poor or near-poor household was well above the proposed minimum, hence putting the highest earner in these households out of the reach of the minimum wage increase. As the next row shows, the median hours of work of these highest earners is well below full-time employment (2,000 hours per year). Increases in their hours of work, rather than a minimum wage hike, would have most effectively increased the

Table 7	Characteristics of Low-income Households: 1989, 1995, and 2003 (percentages)					
	1989 Income-to-Needs Ratios		1995 Income-to-Needs Ratios		2003 Income-to-Needs Ratios	
Household Types	Less than 1 (poverty)	0 to 1.49 (in or near poverty)	Less than 1 (poverty)	0 to 1.49 (in or near poverty)	Less than 1 (poverty)	0 to 1.49 (in or near poverty)
All Households						
No workers	25.7	17.4	26.1	19.7	22.9	17.8
One or more workers	74.3	82.6	73.9	80.3	77.1	82.2
All Working Households						
No minimum wage worker[a]	83.1	84.3	73.8	71.7	70.7	71.6
One minimum wage worker	16.3	14.9	21.7	24.6	27.8	26.9
Two or more minimum wage workers	0.6	0.8	4.5	3.7	1.5	1.5
All Non-Minimum Wage Working Households						
Median wages	$5.50	$6.00	$7.00	$7.11	$9.25	$9.60
Median annual[b]	1,520	1,820	1,680	1,800	1,720	1,872
Median household size	2	2	3	3	4	3

Notes:

[a] A minimum wage worker is defined as making between $3.00 and $4.25 in 1989, $4.00 and $5.14 in 1995, and between $5.00 and $7.24 in 2003.

[b] Highest paid workers in household.

Source: Estimated from the outgoing rotation group of the Current Population Survey, March 1996 and March 2004. Estimates for 1989 from Burkhauser, Couch, and Glenn (1996).

wage earnings of the majority of the working poor. The median number of hours worked per year has increased over the three calendar years shown in Table 7, but so has the average household size of the working poor.

Table 8 presents the same information as Table 7, but focuses solely on poor or near-poor single-mother households.[13] Between 1995 and 2003, the share of poor single-mother households containing a worker increased dramatically from 71.7 percent to 78.3 percent. But even among this subgroup of the working poor, the majority was not helped by the 1996 federal minimum wage increase and will not be helped by the proposed federal minimum wage increase to $7.25 per hour. Only 24.2 percent of poor working single-mother households were helped by the 1996 federal minimum wage increase, and while a greater share of poor working single-mother households will be helped by a federal minimum wage hike to $7.25 per hour (39.6 percent), the majority will not be helped. In contrast, an increase in the EITC would help virtually all of these households. The same is the case if we expand our population to those in or near poverty.

Table 9 provides a closer examination of the relationship between workers' wage rates and the income-to-needs ratio of their households prior to a simulated increase in the federal minimum wage from $4.25 per hour to $5.15 per hour in 1995. Each row shows the wage distribution of workers living in a household with a given income-to-needs ratio.

The last row of Table 9 shows the percentage of all workers in each wage category. An increase in the minimum wage to $5.15 that did not change hours worked would increase the wages of the 8.2 percent of all workers in 1995 who earned between $4.25 and $5.15 per hour. We also assume the 0.4 percent of workers who earned between $4.00 and $4.24 are covered by the federal minimum wage and would be helped. We assume those reporting wage rates below $4.00 per hour are not in federal minimum wage covered employment and would not be helped. Thus, we estimate that the federal minimum wage increase to $5.15 per hour in 1996 only affected 8.6 percent of all workers.

As Table 9 shows, a greater share of workers living in lower income households was helped by this minimum wage increase. That is, there is certainly a connection between low wages and low income—a greater share of those workers who live in poor households held jobs that paid between $4.00 and $5.15 per hour than did workers living in higher income-to-needs households. However, there is substantial variance in the wage earnings of workers within each of our income-to-need categories because most households have more than one worker and many have other sources of income. Hence, even in poor working households (those whose income-to-needs ratio is less than 1), only 27.3 percent of workers (1.4 percent earning between $4.00 and $4.24 and 25.9 percent earning between $4.25 and $5.14) were helped by the minimum wage increase to $5.15 per hour in 1996.

Moreover, as the next to last column shows, the share of all workers who actually live in poor (4.6 percent) or between poor and near-poor households (5.8 percent) is small relative to workers in households that live at three times the poverty line, or $46,707 for a family of four in 1995 (64.1 percent). As can be seen in the last column, we estimate that only a small minority of those helped by the last federal minimum wage increase in 1996 lived in poverty (14.7 percent) or near poverty (15.5 percent). The majority of minimum wage workers (69.8 percent) lived in households well above the poverty line and 40.2 percent lived in households whose income was three times the poverty line or greater.

Table 10 repeats the same exercise done in Table 9 but focuses on working single mothers. As can be seen in the last row of Table 10, the

Table 8	Characteristics of Low-income Single Mothers in 1995 and 2003			
	1995 Income-to-Needs Ratios		2003 Income-to-Needs Ratios	
	Less than 1 (poverty)	0 to 1.49 (in or near poverty)	Less than 1 (poverty)	0 to 1.49 (in or near poverty)
All Households				
No workers	28.3	22.7	21.7	16.5
One or more workers	71.7	77.3	78.3	83.5
All Working Households				
No minimum wage worker[a]	75.8	78.2	62.5	63.1
One minimum wage worker	21.3	19.4	37.4	34.7
Two or more minimum wage workers	2.9	2.4	0.2	2.2

Notes:

[a] A minimum wage worker is defined as making between $3.00 and $4.25 in 1989, $4.00 and $5.14 in 1995, and $5.00 and $7.24 in 2003.

Source: Estimated from the outgoing rotation group of the Current Population Survey, March 1996 and March 2004.

Table 9	Wage Distribution of All Workers by Income-to-Needs Ratio of Their Household in 1995								
	Hourly Wage Categories[a]								
Income-to-Needs Ratio	$0.01 to $3.99	$4.00 to $4.24	$4.24 to $5.14	$5.15 to $7.99	$8.00 to $3.99	$0.01 to $14.99	Total	Percent of All Workers	Percent of Workers Earning More Than $3.99 and Less Than $5.15
Less than 1.00	3.7	1.4	25.9	44.2	21.1	3.7	100.0	4.6	14.7
1.00 to 1.24	5.0	0.8	26.9	36.9	26.6	3.9	100.0	2.5	8.1
1.25 to 1.49	4.1	1.3	17.9	43.7	29.4	3.7	100.0	3.3	7.4
1.50 to 1.99	3.0	0.2	11.4	41.3	37.0	7.1	100.0	7.4	10.1
2.00 to 2.99	2.6	0.3	9.0	29.4	47.0	11.9	100.0	18.1	19.5
3.00 or above	1.1	0.3	5.1	15.1	39.4	39.0	100.0	64.1	40.2
Whole Category Share[b]	1.8	0.4	8.2	22.5	39.1	28.1	100.0	100.0	100.0

Notes:

[a] Hourly wage rates are based on a direct question concerning earnings per hour on their current primary job. All income data used to calculate income-to-needs ratios come from retrospective information from the previous year because that is the period for which it is reported. Wages are in 1996 dollars.

[b] Share of all workers with wage earnings in each category.

Source: Estimated from the outgoing rotation group of the Current Population Survey, March 1996.

Table 10	Wage Distribution of Working Single Mothers by Income-to-Needs Ratio of Their Household in 1995								
	Hourly Wage Categories[a]								
Income-to-Needs Ratio	$0.01 to $3.99	$4.00 to $4.24	$4.24 to $5.14	$5.15 to $7.99	$8.00 to $14.99	$15.00 and Over	Total	Percent of All Workers	Percent of Workers Earning More Than $3.99 and Less Than $5.15
Less than 1.00	4.5	1.3	21.1	51.8	16.9	4.4	100.0	23.7	55.6
1.00 to 1.24	0.0	0.0	6.3	51.9	33.2	8.6	100.0	7.6	5.0
1.25 to 1.49	0.0	0.0	15.7	55.3	26.7	2.3	100.0	10.4	17.2
1.50 to 1.99	0.0	0.0	4.0	33.5	49.4	9.0	100.0	15.3	6.5
2.00 to 2.99	3.4	0.0	5.6	15.7	64.3	11.0	100.0	20.5	12.1
3.00 or above	0.2	0.0	1.5	9.4	46.5	42.4	100.0	22.5	3.6
Whole Category Share[b]	2.4	0.3	9.2	32.4	40.5	15.1	100.0	100.0	100.0

Notes:

[a] Hourly wage rates are based on a direct question concerning earnings per hour on their current primary job. All income data used to calculate income-to-needs ratios come from retrospective information from the previous year because that is the period for which it is reported. Wages are in 1996 dollars.

[b] Share of all workers with wage earnings in each category.

Source: Estimated from the outgoing rotation group of the Current Population Survey, March 1996.

share of working single mothers helped by a minimum wage increase to $5.15 per hour (9.5 percent) is only slightly higher than that of the entire population (8.6 percent). The share of poor single mothers who earn wages between $4.00 and $5.15 is also somewhat greater at all income-to-needs levels. Nonetheless, while the percentage of working single mothers continues to be much higher at lower income-to-needs levels, only 22.4 percent of working single mothers were helped by the last minimum wage increase. However, a much greater share of those single mothers who were helped lived in poor (55.6 percent) and between poor or near-poor households (22.2 percent) (last column) because a greater percentage of all working single mothers live in poor (23.7 percent) and between poor and near-poor households (18.0 percent) (next to last column).

In Table 11, we estimate the yearly cost of increased wages to producers because of a minimum wage increase to $5.15 per hour and how the gains to workers were distributed. But to the extent that markets are perfectly competitive, the costs of higher minimum wages will eventually result in higher prices to consumers for the goods and services they purchase.[14]

Assuming no employment losses or reductions in hours worked, the total cost of the minimum wage hike was $4.79 billion (column 1). While the average benefit per household was approximately the same (column 2) across the income distribution, the share going to the groups was not. As can be seen in column 3, the vast majority of the benefits went to workers in households with income-to-needs ratios greater than 2 (60.6 percent), with 40.1 percent of benefits going to those from households whose incomes were three times the poverty line or greater. Only 14.2 percent of benefits went to workers from poor families. Likewise, the overall gains to vulnerable populations were small—while 4.3 percent of the gains of the 1996 minimum wage hike went to single mother households, only 2.2 percent went to poor single mother households. African-Americans received 15.5 percent of the gains but only 2.9 percent of the benefits accrued to poor African-American workers.[15]

These estimates assume that hours worked and employment status did not change after the 1996 minimum wage hike. But minimum wage increases will cause some workers to lose their jobs. Burkhauser, Couch, and Wittenburg (2000) find that young African-Americans, young non-high school graduates, and teenagers are most likely to lose their jobs as a result of a minimum wage hike. They estimated that a 10 percent minimum wage hike results in an 8.5 percent decline in the employment rate of African-Americans aged 16 to 24, a 5.7 percent reduction in teenage employment (aged 16 to 19), and an 8.5 percent decline in non-high school graduate employment (aged 20 to 24). Moreover, work by Neumark, Schweitzer, and Wascher (2004, 2005) shows that minimum wage increases hurt low-wage workers by reducing their employment and their hours worked, and by increasing the proportion of families that are poor or near-poor. The minimum wage hike was therefore probably even less target-efficient than we estimate.

Our estimates of the benefits of the 1996 minimum wage hike are thus likely upper-bound estimates because we assume that workers' employment status and hours worked remained constant following the policy change. Even using these optimistic assumptions, we conclude that the 1996 minimum wage hike did little to improve the economic well-being of poor households. Most workers from poor households were not helped by the 1996 minimum wage increase because they already earned more than $5.15 per hour. Furthermore, we find that the vast majority of workers who were helped lived in higher income households, so the minimum wage increase was also not target-efficient. These findings are consistent with studies (Burkhauser and Finegan, 1989; Burkhauser, Couch and Glenn, 1996;

Table 11 Distribution of Benefits Across Income-to-Needs Categories from a Federal Minimum Wage Increase from $4.25 to $5.15, Based on the 1995 Wage Distribution

			Distribution of Benefits (percentage)			
Income-to-Needs Ratio	Total Benefits (billions of dollars)	Mean Benefit per Household (dollars)	Total	African-Americans	Non-African Americans	Single-Female Headed Households
Less than 1.00	0.68	$527	14.2	2.9	11.3	2.2
1.00 to 1.24	0.39	630	8.2	0.8	7.4	0.4
1.25 to 1.49	0.33	485	6.8	1.1	5.7	0.6
1.50 to 1.99	0.49	532	10.2	3.0	7.2	0.2
2.00 to 2.99	0.98	600	20.5	3.3	17.2	0.7
3.00 or above	1.92	566	40.1	4.4	35.7	0.2
All Households	4.79	538	100.0	15.5	84.5	4.3

Note:

[a] Simulation assumes hours worked in 1995 remained the same under the new minimum wage and those earning below $4.00 per hour were employed in a job not covered by minimum wage rules.

Source: Estimated from the outgoing rotation group of the Current Population Survey, March 1996.

Burkhauser, Couch, and Wittenburg, 1996; and Burkhauser and Harrison, 1999) of previous minimum wage hikes that suggest that even under the assumption of no adverse employment effects the minimum wage is a poor mechanism for helping the working poor.

As Tables 12, 13 and 14 will show, the proposed Kennedy minimum wage increase from $5.15 to $7.25 will be even less effective in targeting the working poor. While it will do slightly better with respect to the percentage of the working poor whose wages will be increased relative to the last minimum wage increase in 1996, once again the vast majority of the working poor will still not be helped by this increase.

Table 12 uses 2003 wage rates and income distributions to estimate the type of workers who would be helped by increasing the federal minimum wage to $7.25 per hour. The percentage of all workers helped (those earning between $5.00 and $7.24) is 9.7 percent. Once again, a greater share of workers in low income-to-needs households earned this amount. But among poor workers only 31.1 percent did so. So only 31.1 percent of all low-wage workers would be helped by a minimum wage increase to $7.25 per hour. This is somewhat higher than the 27.3 percent who were helped by the last minimum wage increase. However, because an even smaller percentage of all workers lived in poor or near-poor households in 2003 than in 1995 (next to last column) a greater percentage of the workers who are helped by the minimum wage do not live in or near poverty. Only 25.2 percent of those helped by the minimum wage lived in poor or near-poor households in 2003 relative to 30.2 percent in 1995. In contrast, 44.8 percent live in households with incomes three or more times the poverty line ($56,430 for a family of four in 2003). Hence, the target-efficiency of this minimum wage increase is even worse than in 1996.

The dramatic increase in the employment of single mothers has also changed the distribution of wages for that population, but, as Table 13 shows, a great majority of single mothers continue to earn wages well above the proposed minimum wage of $7.25 per hour. Only 13.3 percent of single mothers would be helped by such an increase. While this is larger than the 9.5 percent of single mothers who gained from the last minimum wage increase, it is still a very small share of working single mothers. It is also the case that the share of single mothers earning between $5.00 and $7.25 per hour in lower income-to-needs households is larger than richer single working class mothers. Among poor working mothers, the share who will be helped by a $7.25 per hour minimum wage is 37.8 percent. This is considerably larger than the 22.4 percent of poor working mothers who were helped by the last minimum wage increase, but it is still a minority of all working poor mothers. Furthermore, the dramatic increase in the income of working mothers has reduced the share of all working mothers who live in or near poverty. Thus, the share of working mothers helped by this minimum wage increase who live in poor (18.5 percent) and between poor and near-poor households (13.2 percent) is even smaller than in 1995. As a result, the share of single mothers helped by this minimum wage increase who live in poverty (53.4 percent) or near poverty (27.2 percent) is not much different from the 1996 increase.

Table 14 shows that the total cost of the proposed minimum wage increase will be $18.36 billion. But only 12.7 percent will go to the working poor, an even smaller share than the 14.2 percent from the last round of minimum wage increases. The dramatic increases in the employment of African-Americans and single mothers between 1995 and 2002 will mean that these populations will receive higher shares of the gains, 21.1 percent for African-Americans versus 15.5 percent last time and 8.4 percent for single mothers compared to 4.3 percent last time. But poor African-Americans will only receive 3.7 percent and poor single mothers 3.8 percent of the benefits.

Table 12	Wage Distribution of All Workers by Income-to-Needs Ratio of Their Household in 2003								
	Hourly Wage Categories[a]								
Income-to-Needs Ratio	$0.01 to $4.99	$5.00 to $5.14	$5.15 to $7.24	$7.25 to $8.99	$9.00 to $14.99	$15.00 and Over	Total	Percent of All Workers	Percent of Workers Earning More Than $4.99 and Less Than $7.25
Less than 1.00	4.5	1.2	29.9	24.7	29.0	10.7	100.0	4.2	13.4
1.00 to 1.24	2.7	1.5	22.5	23.2	35.7	14.5	100.0	2.1	5.3
1.25 to 1.49	1.8	1.0	23.8	20.4	38.9	14.1	100.0	2.6	6.5
1.50 to 1.99	2.6	0.6	15.3	21.1	44.5	15.9	100.0	6.4	10.5
2.00 to 2.99	1.7	0.4	11.6	14.3	47.3	24.8	100.0	15.7	19.4
3.00 or above	1.3	0.3	6.0	6.6	28.0	57.8	100.0	69.1	44.8
Whole Category Share[b]	1.6	0.4	9.3	10.2	32.6	45.9	100.0	100.0	100.0

Notes:

[a] Hourly wage rates are based on a direct question concerning earnings per hour at their current primary job. All income data used to calculate income-to-needs ratios come from retrospective information from the previous year because that is the period for which it is reported. Wages are in 2003 dollars.

[b] Share of all workers with wage earnings in each category.

Source: Estimated from the outgoing rotation group of the Current Population Survey, March 2003.

Table 13	Wage Distribution of Working Single Mothers by Income-to-Needs Ratio of Their Household in 2003								
	Hourly Wage Categories[a]								
Income-to-Needs Ratio	$0.01 to $4.99	$5.00 to $5.14	$5.15 to $7.24	$7.25 to $8.99	$9.00 to $14.99	$15.00 and Over	Total	Percent of All Workers	Percent of Workers Earning More Than $4.99 and Less Than $7.25
Less than 1.00	4.4	1.3	36.5	29.0	23.3	5.5	100.0	18.5	53.4
1.00 to 1.24	0.5	1.9	26.9	28.7	36.6	5.5	100.0	6.8	15.0
1.25 to 1.49	2.9	0.0	24.8	22.1	39.4	10.9	100.0	6.5	12.2
1.50 to 1.99	3.6	0.0	3.2	17.4	64.1	11.8	100.0	14.3	3.4
2.00 to 2.99	1.8	0.0	6.2	6.9	59.2	25.8	100.0	22.9	10.9
3.00 or above	0.9	0.0	2.1	6.0	25.9	67.6	100.0	31.0	5.1
Whole Category Share[b]	2.2	0.4	12.8	14.7	40.1	29.9	100.0	100.0	100.0

Notes:

[a] Hourly wage rates are based on a direct question concerning earnings per hour at their current primary job. All income data used to calculate income-to-needs ratios come from retrospective information from the previous year because that is the period for which it is reported. Wages are in 2003 dollars.

[b] Share of all workers with wage earnings in each category.

Source Estimated from the outgoing rotation group of the Current Population Survey, March 2003.

Table 14 Distribution of Benefits Across Income-to-Needs Categories from a Federal Minimum Wage Increase from $5.15 to $7.25, Based on the 2003 Wage Distribution

			Distribution of Benefits (percentage)			
Income-to-Needs Ratio	Total Benefits (billions of dollars)	Mean Benefit per Household (dollars)	Total	African-Americans	Non-African Americans	Single-Female Headed Households
Less than 1.00	2.33	$1,110	12.7	3.7	9.0	3.8
1.00 to 1.24	1.16	1,392	6.3	1.7	4.6	1.3
1.25 to 1.49	1.34	1,298	7.3	2.3	5.0	1.1
1.50 to 1.99	1.91	1,151	10.4	2.6	7.8	1.0
2.00 to 2.99	3.95	1,289	21.5	3.8	17.7	0.8
3.00 or above	7.67	1,090	41.8	7.0	34.8	0.4
All Households	18.36	1,167	100.0	21.1	78.9	8.4

Note:

[a] Simulation assumes hours worked in 2003 remained the same under the new minimum wage and those earning below $5.00 per hour were employed in a job not covered by minimum wage rules.

Source: Estimated from the outgoing rotation group of the Current Population Survey, March 2003.

VII. Conclusions

Minimum wage increases have become a weaker and weaker policy tool for increasing the household income of the working poor. While a somewhat higher percentage of the working poor will be helped by the proposed Federal minimum wage increase to $7.25 per hour than were helped by the last Federal minimum wage increase in 1996, the percentage helped is still small—31.1 vs. 27.3 percent. Furthermore, the target-efficiency of this increase is worse, as an even larger percentage of those who are helped do not live in or even near poverty—74.8 vs. 69.8 percent. This is true despite the increase in the share of low-wage workers who were household heads between 1989 and 2003. While the post-1996 rise in the labor force participation rates of single mothers increased the share of the gains they will receive from a minimum wage hike, even among this more vulnerable population, the majority of working poor mothers will not gain from the proposed $7.25 minimum wage increase. So even the growth in the share of single mothers in the low-wage population has not changed the downward spiral in the target-efficiency of minimum wage increases. Neither will the vast majority of the working poor be helped by this latest proposed increase.

Even the small gains that we find among the working poor probably overestimate the actual gains of the proposed legislation to the working poor since, for purposes of this paper, we assume that minimum wage increases will have no negative employment effects. In fact, the preponderance of evidence suggests that teenagers, young African-Americans and young high school dropouts will experience reductions in their employment rates when minimum wages are increased.

An effective policy alternative to the minimum wage is the Earned Income Tax Credit (EITC). The federal EITC program provides a tax credit of 40 cents for every dollar in wages earned by a worker in a low-income family with two or more children, and a credit of 34 cents per dollar earned for a worker in a poor family with one child. Thus, workers living in poor, one-child families and earning the current federal minimum of $5.15 per hour have an effective minimum wage of $6.90 per hour, and workers living in poor families with two or more children have an effective minimum wage of $7.21 per hour. In some states federal EITC programs are supplemented by state programs and provide even greater benefits to the working poor. (See Burkhauser and Sabia, 2004 for a discussion of the New York EITC supplement in the context of minimum wage policy.)

In contrast to the minimum wage, which is based solely on a worker's wage rate, the EITC is based on family income. Thus, a worker earning $7.25 or more per hour and living in a poor family would not benefit from the proposed minimum wage hike, but would be eligible for EITC benefits. Most poor or near-poor households—especially single mothers—would benefit from the EITC, while only a minority would gain from a minimum wage hike. Moreover, because EITC costs are not borne by employers, there will be no reduction in employers' demand for low-skill workers, as is the case with a minimum wage increase.

The minimum wage makes little sense in 21st Century labor markets, where multiple workers living in a single household is the rule rather than the exception and being a low-wage worker is only fuzzily connected to living in poverty. Policymakers should focus on expansions in the EITC rather than increases in the minimum wage to ensure that those who work hard and play by the rules do not live in poverty. The fact that welfare reforms have increased the share of single mothers in the low-wage population has not changed this reality.

Appendix Table 1A	Wage Distribution of All Workers by the Income-to-Needs Ratio of Their Household, 2003[a]								
	Hourly Wage Categories[a]								
Income-to-Needs Ratio	$0.01 to $4.99	$5.00 to $5.14	$5.15 to $6.24	$6.25 to $8.99	$9.00 to $14.99	$15.00 and Over	Total	Percent of All Workers	Percent of Workers Earning More Than $4.99 and Less Than $6.25
Less than 1.00	4.4	1.1	11.8	42.2	29.6	11.0	100.0	4.4	14.2
1.00 to 1.24	2.7	1.7	9.8	36.8	36.5	12.6	100.0	2.3	6.6
1.25 to 1.49	1.8	1.1	8.2	33.6	39.6	15.8	100.0	2.5	5.9
1.50 to 1.99	2.9	0.5	6.0	29.3	45.2	16.1	100.0	6.8	11.1
2.00 to 2.99	1.6	0.4	4.5	20.6	47.3	25.6	100.0	16.1	19.8
3.00 or above	1.3	0.3	2.2	10.3	27.8	58.2	100.0	67.9	42.4
Whole Category Share[b]	1.7	0.4	3.6	15.8	32.7	45.9	100.0	100.0	100.0

Notes:

[a] Hourly wage rates are based on a direct question concerning earnings per hour at their current primary job. All income data used to calculate income-to-needs ratios come from retrospective information from the previous year because that is the period for which it is reported. Wages are in 2003 dollars.

[b] Share of all workers with wage earnings in each category.

Source: Estimated from outside rotation group of the March 2004 Current Population Survey.

Appendix Table 2A	Wage Distribution of Single Mother Households by the Income-to-Needs Ratio of Their Household, 2003[a]								
	Hourly Wage Categories[a]								
Income-to-Needs Ratio	$0.01 to $4.99	$5.00 to $5.14	$5.15 to $6.24	$6.25 to $8.99	$9.00 to $14.99	$15.00 and Over	Total	Percent of All Workers	Percent of Workers Earning More Than $4.99 and Less Than $6.25
Less than 1.00	4.2	1.2	16.7	48.7	23.7	5.4	100.0	19.1	65.2
1.00 to 1.24	2.2	1.7	8.5	42.4	39.6	5.6	100.0	7.5	14.6
1.25 to 1.49	3.2	0.0	7.9	36.6	41.3	10.9	100.0	6.1	9.1
1.50 to 1.99	4.1	0.0	0.7	19.0	61.9	14.3	100.0	14.8	1.9
2.00 to 2.99	1.9	0.0	2.1	11.2	59.3	25.6	100.0	22.5	9.1
3.00 or above	0.6	0.0	0.0	8.0	24.4	67.1	100.0	30.1	0.0
Whole Category Share[b]	2.4	0.4	4.9	22.4	39.8	30.1	100.0	100.0	100.0

Notes:

[a] Hourly wage rates are based on a direct question concerning earnings per hour at their current primary job. All income data used to calculate income-to-needs ratios come from retrospective information from the previous year because that is the period for which it is reported. Wages are in 2003 dollars.

[b] Share of all workers with wage earnings in each category.

Source: Estimated from outside rotation group of the March 2004 Current Population Survey.

Appendix Table 3A — Distribution of Benefits Across Income-to-Needs Categories from a Federal Minimum Wage Increase from $5.15 to $6.25, Based on the 2003 Wage Distribution

			Distribution of Benefits (percentage)			
Income-to-Needs Ratio	Total Benefits (billions of dollars)	Mean Benefit per Household (dollars)	Total	African-Americans	Non-African Americans	Single-Female Headed Households
Less than 1.00	$0.61	$661	13.0	3.9	9.1	3.2
1.00 to 1.24	0.35	818	7.5	2.8	4.7	1.5
1.25 to 1.49	0.29	777	6.3	1.9	4.4	0.8
1.50 to 1.99	0.53	742	11.4	3.2	8.2	0.1
2.00 to 2.99	1.02	803	21.9	3.6	18.3	0.8
3.00 or above	1.86	698	39.8	8.5	31.3	0.0
All Households	4.67	722	100.0	23.9	76.1	6.4

Notes:

[a] Hourly wage rates are based on a direct question concerning earnings per hour at their current primary job. All income data used to calculate income-to-needs ratios come from retrospective information from the previous year because that is the period for which it is reported. Wages are in 2003 dollars.

[b] Share of all workers with wage earnings in each category.

Source: Estimated from outside rotation group of the March 2004 Current Population Survey.

Appendix Table 4A	Proportion of All Low-Wage Household Heads, by Household Size, 1989–2003			
	Year			
Household Size	1989	1995	2000	2003
1	7.2	7.3	8.3	7.7
2	24.1	24.0	23.3	22.3
3	23.8	23.4	22.4	23.0
4	23.7	23.2	22.7	23.9
5+	21.3	22.0	23.4	23.1

Source: Estimated from the outgoing rotation group of the March 2004 Current Population Survey.

Appendix Table 4B	Proportion of Low-Wage Household Heads Living in Poverty, by Household Size, 1989–2003			
	Year			
Household Size	1989	1995	2000	2003
1	16.8	14.7	15.6	14.4
2	19.3	19.5	19.7	20.1
3	18.4	19.5	20.4	20.2
4	20.4	18.9	19.9	22.8
5+	21.1	27.4	24.4	23.6

Source: Estimated from the outgoing rotation group of the March 2004 Current Population Survey.

Endnotes

1. The EITC was enacted in 1975 as a means of offsetting Social Security payroll taxes paid by workers in poor households. However, in 1975, the EITC offered a relatively small maximum benefit of $400 with a 10 percent credit rate. Important changes in the EITC in 1993 raised the 1994 credit rate to 26.3 percent for a working family with one child, with a maximum benefit level of $2,030 and established a series of further increases through 1996. In 2003, these parameters were 34 percent and $2,547, respectively.

2. In 2003, 12 states had minimum wage levels higher than the Federal minimum wage of $5.15 per hour. These higher state minimum wages are imbedded in our analysis on the impact of increasing the Federal minimum wage, since workers' wage rates will already reflect their state's minimum wage. That is, we are estimating the impact of an increase in the current Federal minimum wage, given the current structure of state minimum wages.

3. While it is true that the Federal minimum wage is now at an historic low relative to the average private sector wage, the total "income floor" provided by both the minimum wage and the Earned Income Tax Credit (EITC) remains relatively generous. That is, Federal policy not necessarily become more "stingy," but rather has shifted away from minimum wage hikes and toward expansions in the EITC as a mechanism for increasing the earnings of low-skill laborers.

4. The AFL-CIO has consistently argued that "[f]airness to the working poor demands that the federal minimum wage should not be less than 50 percent of average annual earnings of non-supervisory workers and production workers in the non-farm private economy" (see, for example, AFL-CIO Reviews the Issues, "Restore the Floor … It's Time to Raise the Minimum Wage," Report No. 86: October 1995).

5. For data presented from 1939 through 1979, the Decennial Census is used to calculate wage data. Thereafter, wages are calculated using retrospective data from the Current Population Survey (CPS). A fuller discussion of the use of the Census and CPS data appears in Burkhauser, Couch, and Glenn (1996).

6. For 1939, the income-to-needs ratio is given by the ratio of the household's wage or salary earnings to its poverty level because data were not available on non-wage or non-salary income.

7. Furthermore, work by Neumark, Schweitzer, and Wascher (2004) finds that low-wage workers are harmed by minimum wage increases.

8. In our income calculations, we are using CPS-based pre-tax, post-transfer increase. This is consistent with how official U.S. Census poverty measures are calculated. But this measure ignores the income that working household heads receive from EITC benefits. Including EITC benefits would lower the share of poor working heads, especially of working single mothers in poverty.

9. Individuals are defined as working if they worked at least 14 hours per week and at least 15 weeks per year in the previous year.

10. Note that we use cross-sectional data to measure gross changes in the distribution of all single mothers who held no jobs or held jobs at various wage rates across these years. We are not directly measuring the wage distribution of those who left the welfare rolls over time. To do so, one would need longitudinal data that would show the actual hourly wage rates of single mothers who worked after leaving the welfare rolls. But our analysis does show that increases in the share of higher wage jobs account for the majority of the gross increases in the share of single mothers who hold jobs across these years.

11. Workers paid by the hour directly report their hourly wage rate. As argued in Burkhauser, Couch, and Glenn (1996) and Burkhauser and Harrison (1999), these data are better suited for simulating the effects of a rise in the minimum wage because they do not require workers to recall earnings and hours from the previous year.

12. Wages calculated in Tables 7–14 come from estimates using the outgoing rotation group of the CPS.

13. Data on median annual hours worked and median wage rates for working single mothers in poverty that earn more than the proposed minimum wage ($5.15 in 1995 and $7.25 in 2003) are not presented due to small sample sizes.

14. In this analysis we do not attempt to measure the general equilibrium effects of minimum wage

increases on the poor. Macurdy and McIntyre (2001) argue that because poor families are likely to have a smaller share of their income come from employment and are more likely to purchase goods and services that are produced by low skilled labor, a disproportionate amount of the cost of minimum wage increases will be borne by the poor.

15. The share of benefits from a minimum wage hike that accrue to workers in poor (non-poor) households is not necessarily equivalent to the share of minimum wage workers in poor (non-poor) households. For example, in 1995, 14.7 percent of minimum wage workers lived in poor households (see the first row of the final column in Table 9). However, as the first row of the third column in Table 11 shows, workers in poor families gained only 14.2 percent of the benefits from the minimum wage hike. The difference in these percentages arises because benefits are calculated based upon hours worked per year, weeks worked per year, and the difference between the proposed minimum wage and the worker's current wage. Thus, if workers in poor households work fewer hours, fewer weeks, or have wage rates closer to the proposed minimum wage than workers in non-poor households, we would expect the share of benefits they receive to be less than the percentage of workers they represent.

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The Effect of Minimum Wage Increases on Retail and Small Business Employment

by Joseph J. Sabia, University of Georgia
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The Employment Policies Institute (EPI) is a nonprofit research organization dedicated to studying public policy issues surrounding employment growth. In particular, EPI research focuses on issues that affect entry-level employment. Among other issues, EPI research has quantified the impact of new labor costs on job creation, explored the connection between entry-level employment and welfare reform, and analyzed the demographic distribution of mandated benefits. EPI sponsors nonpartisan research that is conducted by independent economists at major universities around the country.

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Executive Summary

Overview

A recent study by the Fiscal Policy Institute (FPI) claims that increases in the minimum wage at the state level have had no adverse employment effects. Specifically, the FPI report concludes that states that raised their wage floor above the federal level did not experience declines in small business employment, and, in fact, actually experienced an increase in retail employment.

While the FPI study has been frequently cited by supporters of increases in the minimum wage, the study is based on faulty statistical methods, and its results provide an inaccurate picture of the effect of state-level minimum wage increases. This paper, by Dr. Joseph Sabia of the University of Georgia, presents a more careful and methodologically rigorous analysis of state-level minimum wage increases. His results confirm the consensus economic opinion that increases in the minimum wage decrease employment, particularly for low-skilled and entry-level employees.

Employment Results

Using government data from January 1979 to December 2004, the effect of minimum wage increases on retail and small business employment is estimated. Specifically, a 10 percent increase in the minimum wage is associated with a 0.9 to 1.1 percent decline in retail employment and a 0.8 to 1.2 percent reduction in small business employment.

These employment effects grow even larger for the low-skilled employees most affected by minimum wage increases. A 10 percent increase in the minimum wage is associated with a 2.7 to 4.3 percent decline in teen employment in the retail sector, a 5 percent decline in average retail hours worked by all teenagers, and a 2.8 percent decline in retail hours worked by teenagers who remain employed in retail jobs.

These results increase in magnitude when focusing on the effect on small businesses. A 10 percent increase in the minimum wage is associated with a 4.6 to 9.0 percent decline in teenage employment in small businesses and a 4.8 to 8.8 percent reduction in hours worked by teens in the retail sector.

Methodological Concerns in the Fiscal Policy Institute Report

The results in this report are all statistically significant. In both the small business and retail industry analyses conducted by FPI, however, no explicit tests for statistically significant differences in employment were presented. This is only one of the important differences between this study and the FPI report. Another is that while the FPI report chiefly examines employment changes over only two time periods (1998 and 2001), this study examines the effect of state minimum wage increases on employment across a significantly longer time period (1979-2004).

Even more troubling, the FPI analysis does not control for any changes in state-level socioeconomic or demographic characteristics that could affect both minimum wage hikes and changes in employment. For example, states may choose to raise their minimum wages when they anticipate strong economic growth in sectors that employ a large share of minimum-wage workers. If this is true, then estimates of the impact of the minimum wage on employment will be biased toward zero. Put another way, the FPI study does not hold "all else equal" in estimating the effect of the minimum wage.

By controlling for economic and demographic changes that may be associated with both the implementation of minimum wage increases and changes in teenage employment, this study is able to more credibly isolate the effect of minimum wage increases.

Conclusion

These findings provide consistent evidence that minimum wage increases result in a significant decline in retail and small business employment. This finding is robust across several model specifications. Furthermore, these findings refute many of the claims raised in the FPI study so often cited in favor of minimum wage increases at the state and federal levels. The differences between these studies are likely a result of the more careful and appropriate methodological methods utilized in this study.

Taken together with other recent work, the results of this study suggest that low-skilled employees will find themselves unable to escape adverse labor market consequences resulting from minimum wage increases. Instead of passing these politically popular but destructive mandates, policymakers should consider other programs to help the working poor such as the Earned Income Tax Credit. The EITC is a far more effective policy tool to reduce poverty among poor families. Moreover, the EITC has the advantage of avoiding the adverse employment effects described in this study.

The Effect of Minimum Wage Increases on Retail and Small Business Employment

Introduction

A recent study by the Fiscal Policy Institute (FPI) (2004) suggests that minimum wage increases do not have adverse employment effects. The authors of the FPI report conclude that states that increased their minimum wages above the federal minimum did not experience declines in small business employment, and, in fact, actually experienced an increase in retail employment. Along with the influential studies of Card et al. (1994) and Card and Krueger (1995), the findings of the FPI study challenge the widely shared view among labor economists that minimum wage hikes cause unemployment of low-skilled workers (Fuchs et al., 1998).

The results of the FPI study have been publicized in the mainstream media (see, for example, New York *Newsday*, 2006) and have been cited by numerous advocates of minimum wage increases at both the federal and state levels. In 2004, Dr. Jared Bernstein, a senior economist at the Economic Policy Institute, testified before the U.S. House Subcommittee on Workforce, Empowerment, and Government Programs. He claimed that a federal minimum wage hike would not have disemployment effects, citing the FPI study's results on retail and small business employment as evidence for his position. Bernstein stated that "between 1998 and 2001, the number of small business establishments grew twice as quickly in states with higher minimum wages (3.1% vs. 1.6%)" (Bernstein, 2004).

In May 2005, United States Senator Ted Kennedy (D-MA) re-introduced legislation to raise the federal minimum wage from $5.15 to $7.25, and argued that minimum wage increases had no adverse employment effects in the retail industry:

> "History clearly shows that raising the minimum wage has not had any negative impact on jobs, employment, or inflation. In the four years after the last minimum wage increase passed, the economy experienced its strongest growth in over three decades. More than 11 million new jobs were added, at a pace of 232,000 per month. There were ten million new service industry jobs, including more than one and a half million retail jobs, of which nearly 600,000 were restaurant jobs." (Kennedy, 2005)

Several advocates of state minimum wage hikes have also cited the conclusions of the FPI study. In a legislative analysis of California Senate Bill 1162—which would raise the state minimum wage from $7.25 to $7.75—the Committee on Industrial and Labor Relations bolstered its support for a minimum wage hike by referring to "a recent Fiscal Policy Institute (FPI) study of state minimum wages [that] found no evidence of negative employment effects on small businesses" (CSCILR, 2004).

In February 2005, Steve Hill of the Maryland Budget and Tax Policy Institute testified before the Maryland Senate Finance Committee in support of a proposed minimum wage hike and cited the FPI study, stating, "Between 1998 and 2001, the number of small business establishments grew twice as quickly in states with higher minimum wages [and] retail employment grew 1.5 times more quickly in higher minimum wage states" (Hill, 2005).

In September 2005, economist Stephen Herztberg testified before the Pennsylvania Senate Labor and Industry Committee and cited the

"recent Fiscal Policy Institute study of state minimum wages [that] found no evidence of negative employment effects" to support his claim that the state minimum wage should be raised. Judith Conti, director of the D.C. Employment Justice Center, testified in support of a minimum wage in the District of Columbia by telling the D.C. Committee on Public Services:

> "There are many credible and well-documented studies that prove that modest raises in the minimum wage have a negligible impact on employment levels or the rate of businesses closing. Indeed, a raise in the minimum wage usually accomplishes the exact opposite. Workers who make more money have more money to invest in consumer goods. The whole community wins. An April 2004 Fiscal Policy Institute study showed that in states with a minimum wage above $5.15, rather than having to lay workers off, small businesses experienced higher employment than their counterparts in states with lower minimum wages." (Conti, 2005)

Thus, along with the studies of Card et al. (1994) and Card and Krueger (1995), the results of the FPI study have become an important talking point among advocates of state and federal minimum wage hikes. However, there are important theoretical and methodological problems with the FPI report that cast doubt on the conclusion that minimum wage hikes have no adverse effects on retail and small business employment.

This study presents a more careful analysis of the effect of minimum wage hikes during the 1980s, 1990s, and 2000s and finds that there are important adverse employment effects among low-skilled workers in the retail sector and in small businesses. Using Current Population Survey (CPS) data from January 1979 to December 2004, the effect of minimum wage increases on retail and small business employment is estimated. Teenagers are examined as a population of interest because they represent a group of low-skilled workers that are most likely to be directly affected by minimum wage hikes. This study examines the effect of minimum wage increases on the following employment outcomes:

- the share of individuals aged 16-64 employed in the retail industry;
- the share of individuals aged 16-64 employed in small businesses;
- the share of teenagers (age 16-19) employed;
- average hours worked by all teenagers;
- average hours worked by employed teenagers;
- the share of teenagers employed in the retail industry;
- average hours worked by teenagers in the retail industry;
- the share of teenagers employed in small businesses; and
- average hours worked by teenagers in small businesses.

Estimation results suggest consistent evidence of a significant negative relationship between minimum wage increases and retail and small business employment. A 10 percent increase in the minimum wage is associated with a 0.9 to 1.1 percent decline in the share of individuals aged 16-64 who are employed in the retail industry, and a 0.8 to 1.2 percent reduction in the share of individuals aged 16-64 employed in small businesses.

As expected, the effects of minimum wage hikes are larger in magnitude for low-skilled

workers. A 10 percent increase in the minimum wage is associated with a 2.7 to 4.3 percent decline in the ratio of teenagers employed in the retail sector, a 5 percent decline in average retail hours worked by all teenagers, and a 2.8 percent decline in retail hours worked by teenagers who remain employed in retail jobs. For small businesses, the disemployment effects are even larger. A 10 percent increase in the minimum wage is associated with a 4.6 to 9.0 percent decline in the ratio of teenagers employed in businesses with 100 or fewer employers, a 4.8 to 8.8 percent decline in average small business hours worked by all teenagers, and a 5.6 to 7.3 percent decline in average small business hours worked by teenagers who remain employed in small businesses.

The results of this study cast doubt on the Fiscal Policy Institute's claim that raising the minimum wage will have no adverse effects on low-skilled employment in retail or small businesses. These findings suggest that state minimum wage increases have adverse effects on employment in retail and small businesses. Moreover, the results suggest that teenagers —a group of low-skilled workers most likely to be adversely affected by minimum wage hikes—experience important declines in employment and hours worked due to minimum wage increases. Taken together with other research by labor economists (Abowd, Kramarz, Lemieux, and Margolis, 2004; Burkhauser, Couch, and Wittenburg, 2000a; Burkhauser, Couch, and Wittenburg, 2000b; Deere, Murphy, and Welch, 1995; Neumark and Wascher, 1994; Neumark et al., 2001; Neumark et al., 2004, 2005; Burkhauser, Couch, and Glenn, 1996; Burkhauser and Sabia, 2004), this finding suggests that raising the minimum wage is a poor policy tool to aid low-skilled workers.

Empirical Literature

The "new economics of the minimum wage" literature was forged by Card et al. (1994) and Card and Krueger (1995). Using Current Population Survey (CPS) data from 1979 to 1992, these authors found that state minimum wage increases did not have adverse employment effects. Following these highly publicized series of papers, many researchers have used the CPS to estimate the impacts of minimum wage increases on the employment of low-skilled workers (Abowd, Kramarz, Lemieux, and Margolis, 2004; Burkhauser, Couch, and Wittenburg, 2000; Deere, Murphy, and Welch, 1995; Neumark and Wascher, 1994; Neumark et al., 2002; Neumark et al., 2004, 2005). Most of these studies have found that raising the minimum wage is associated with a reduction in the employment of low-skilled workers, including teenagers, restoring a general consensus among labor economists that minimum wage hikes have adverse employment effects (Fuchs et al., 1998).[1]

A recent FPI study (2004), however, finds its inspiration in earlier studies by Card and Krueger (1995), with the twist of focusing on the relationship between minimum wage increases and employment in retail and small businesses. The authors focus on retail and small businesses because, they argue, such sectors have large concentrations of low-skilled laborers that are expected to be most adversely affected by minimum wage hikes. Using data from the U.S. Commerce Department's County Business Patterns in 1998 and 2001, the authors compare the change in small business employment in states that raised the minimum wage with the change in small business employment in states that did not raise the minimum wage, and find no difference in small business employment. Moreover, when the authors compare the change in retail employment, they concluded that "retail

employment grew by 6.1 percent in minimum wage states versus 1.9 percent in other states." However, in both the small business and retail industry analyses, no explicit tests for statistically significant differences in employment were presented.

There are several important shortcomings with the FPI study, which are addressed in the current study. First, while the FPI report chiefly examines employment changes over two time periods (1998 and 2001), this study examines the effect of state minimum wage increases on employment across a longer time period: 1979-2004. Both the greater sample size and the greater within-state variation in minimum wages enhance the statistical power of this study.

Second, the FPI analysis does not control for any changes in state-level socioeconomic or demographic characteristics that could affect both minimum wage hikes and changes in employment. For example, states may choose to raise their minimum wages when they anticipate strong economic growth in sectors that employ a large share of minimum wage workers. If this is true, then estimates of the impact of the minimum wage on employment will be biased toward zero. Put another way, the FPI study does not hold "all else equal" in estimating the effect of the minimum wage. The current study includes several state-specific and national control variables designed to better hold all else equal in estimating the effect of minimum wage increases. By controlling for economic and demographic changes that may be associated with both the implementation of minimum wage increases and changes in teenage employment, this study is able to more credibly isolate the effect of minimum wage increases. These control variables include the state-specific prime male age unemployment rate, the average wage rate of adults, the share of the state population that are teenagers, whether the national economy is in a recession, seasonal employment trends, unobserved national trends, state-specific unobserved linear trends, and time-invariant unobserved state-specific characteristics.[2]

Third, the FPI study uses the overall retail or small business employment rate as the dependent variable. While it is true that the concentration of low-skilled workers in both retail and small businesses warrants special attention to these sectors, the presence of skilled workers in these sectors creates an important problem. Minimum wage increases are not expected to directly impact the employment rates of non-minimum wage workers. Moderately- or highly-skilled workers, for example, will not be directly affected by state minimum wage hikes. Thus, the FPI report may find no difference in overall employment rates between states that raised their minimum wage and states that did not, because adverse employment effects may simply be "masked" by the inclusion of skilled workers in the employment measure. This problem is amplified by the limited statistical power of the report's evaluation design. Rather than examine the overall employment rate in these sectors, it may be more appropriate to examine the employment of workers most likely to be affected by the minimum wage—low-skilled workers. The current study examines the effect of minimum wage increases on the labor market outcomes of a group of low-skilled workers that is likely to be affected by such policy changes: teenagers. Examining the outcomes of teenagers will allow an examination of whether the FPI results "masked" adverse employment effects experienced by low-skilled workers in retail and small businesses. This study uses state-specific minimum wage rates rather than grouping all states with minimum wages higher than the federal minimum together and treating them identically.

Fourth, the FPI study assumes that every state with a minimum wage higher than the federal minimum wage will have the same effect

on all workers. But since each of these states has a different minimum wage, it is inappropriate to group such states together. More precisely estimated policy impacts that take into account each state's minimum wage rate are desirable, and this is done in the current study.

Fifth, the FPI study examines only the effects of minimum wage increases on employment rates. But minimum wage increases may affect not only employment decisions by employers, but hours worked among current employees. Neumark, Schweitzer, and Wascher (2004, 2005) have emphasized the need for more complete analyses of the impacts of minimum wage increases, focusing not only on employment, but also on wages, hours worked, and earnings. For example, in their 2004 paper, these authors conclude that while "workers who initially earn near the minimum wage experience wage gains[,] their hours and employment decline, and the combined effect of these changes on earned income suggests adverse consequences, on net, for low-wage workers." Unlike the FPI study, this study examines hours worked to provide a more complete picture of the effect of minimum wage increases on labor market outcomes. This is important because firms may respond to minimum wage increases not only by reducing their number of employees but also hours offered existing employees. And finally, this study explicitly allows for the possibility that the lagged minimum wage may affect current year employment. Taken together, these methodological and theoretical improvements will permit more credible estimates of the effect of minimum wage increases on the employment outcomes of low-skilled workers in small or retail businesses.

Finally, the methodology used in the FPI report does not explicitly allow for lagged minimum wage effects. Neumark et al. (1994) note that firms may respond to minimum wage hikes following their implementation. It may be that the prevailing minimum wage in the previous period may impact employment decisions in the current period. That is, there may be important lagged effects that should be incorporated into analyses of the effects of minimum wage increases. This is done in the current study.

Econometric Model

Following Card and Krueger (1995) and Burkhauser et al. (2000), a fixed effects model of the following form is used to estimate the employment models:

1

$$E_{ijt} = \alpha + s_i \delta_i + m_j \lambda_j + \tau_t \theta_t + MW_{ijt} \gamma + X_{ijt} \beta + \varepsilon_{ijt}$$

where E_{ijt} is the ratio of employment to population in state *i* in month *j* in year *t*, s_i is a time-invariant state effect, m_j is a seasonal (month) effect, τ_t is a year effect, MW_{ijt} is the natural logarithm of the larger of the state or federal minimum wage, and X_{ijt} is a set of state-specific time-varying observables.[3] Each of the control variables is included because each is expected to have an impact on employment, and the variable's omission may result in a biased estimate of the impact of minimum wage increases.

The dependent variable is a measure of employment to population, as is common in the minimum wage literature. This measure is preferred to employment levels because employment levels may change simply because of state-specific changes in the working-age population over time. Five specific employed to population measures are used:

- the share of individuals aged 16-64 employed in the retail industry;
- the share of individuals aged 16-64 employed in small businesses;

- the share of 16-19 year-olds employed;
- the share of 16-19 year-olds employed in retail businesses; and
- the share of 16-19 year-olds employed in small businesses.

In the model described in equation (1), the state effect (δ) is included to capture any state-specific, time-invariant unobserved characteristics associated with employment rates. For instance, if there is a stronger work ethic among teens in Georgia than in New York, the state effect will capture this, as long as this unmeasured work ethic does not change over time in Georgia or New York. A time-varying state-level measure of the prime age unemployment rate and year effects are included so as to capture changes in macroeconomic conditions that may be correlated with the adoption of state-level minimum wage changes and with changes in employment. Month effects are included to capture seasonal trends in employment. The key parameter of interest is. The estimate of can be interpreted as the effect of state minimum wage hikes above the federal minimum wage on teenage employment.[4]

The empirical framework described in equation (1) can be extended to permit delayed employment effects through the inclusion of a lagged minimum wage variable, and nonlinear impacts of minimum wage increases by using dummy variables for each state and federal minimum wage rather than the continuous measure described in equation (1). These alternate specifications are estimated to show that estimation results are not sensitive to modest changes in the model specification.

In addition to estimating employment effects, this study also examines the effects of minimum wage increases on average hours worked by teenagers:

2

$$H_{ijt} = \alpha + s_i\delta_i + m_j\lambda_j + \tau_t\theta_t + MW_{ijt}\gamma + X_{ijt}\beta + \varepsilon_{ijt}$$

where H_{ijt} is the natural log of the average hours worked by individuals. Six measures of average hours worked are used:

- average hours worked by all 16-19-year-olds(including nonworkers);
- average hours worked by employed 16-19-year-olds;
- average retail hours worked by all 16-19year-olds (including nonworkers);
- average retail hours worked by 16-19 year-olds employed in retail jobs;
- average small business hours worked by all 16-19-year-olds (including nonworkers);
- average retail hours worked by 16-19-year-olds employed in small business jobs;

Because employers may respond to minimum wage increases not only by reducing employment but also by reducing hours worked, estimating models such as equation (2) will provide a more complete picture of the effect of minimum wage increases on labor market outcomes.

Data

The data for the overall and retail employment analyses come from the CPS Merged Outgoing Rotation Group (MORG) from January 1979 to December 2004. From these individual-level data, a panel of states and months is created. There are approximately 22,000 to 23,000 individuals aged 16-64 in each month, and these individual observations, along with their respective weights, are used to create nationally representative state-month observations. While several previous studies have used panels of states and years using CPS data (Card and Krueger, 1995; Neumark and Wascher, 1994; Deere et al., 1995), Burkhauser et al. (2000) argue in favor of state-month observations due to (i) the statistical power gained from the increase in the overall sample size and (ii) the

gain in month-specific variation in the state or federal minimum wage. The total sample size for the overall and retail employment analysis is 11,861.[5]

For the analysis of small business employment, monthly data on employer size are not available, and annual information is only available beginning in the late 1980s. A panel of states and years is constructed using the March CPS outgoing rotation group data from March 1989 to March 2005. There are 867 observations used in the small business employment analysis, so the power of the evaluation design is weakened.

Table 1 presents the names, definitions, and weighted means of the dependent and independent variables used in the econometric analysis. The key dependent variables are listed first. They include the ratio of individuals aged 16-64 who are employed in retail jobs (ORETAIL) and in small businesses (OSMALL). A retail sector job is defined using the two-digit Standard Industrial Classification (SIC)-based Detailed Industry Classification Code and the North American Industry Classification System (NAICS).[6] An individual is defined to have been employed in the retail industry if he or she reports working positive hours last week in a retail job. The mean ratio of retail employment to population in the sample is 0.11.

Data on employer size are available in the CPS from March 1989 to March 2005. In annual surveys, workers were asked, "Counting all locations where [your primary] employer operates, what is the total number of persons who work for [the] employer?" This measure of employer size may be measured with error since employees may not know the number of locations of their employer and may be ignorant of the total number of employees. Indeed, comparing CPS reports on employer size to the Census' Statistics on U.S. Businesses, the Small Business Administration (1997) concludes that while the CPS may understate true employer size, the CPS is still, the CPS is still valuable in its matching of individual characteristics to characteristics of their employers. In this study, an individual is defined as employed in a small business if he or she reports working for an employer with 100 or fewer employees at all locations.[7]

It is important to note that individuals in the March CPS are asked about employer size for their *previous year's* employment, rather than current employment, as is the case for retail employment. Hence, for the small business analysis, labor market participation information must be used from the previous year. Moreover, minimum wage information must be used from the year prior to the administering of the survey. For the small business sample, an individual is defined as employed if he or she reported working positive hours in the previous *year.* The mean ratio of small business employment to population in the sample is 0.34.

For low-skilled workers—teenagers—the key dependent variables include the natural logarithm of the average teenage wage rate (TEENWAGE), the ratio of teenagers employed to the teenage population (TEMPLOY), the natural log of the average number of hours worked by all teenagers (THOURS), and the natural log of the average number of hours worked by employed teens (THOURSW). The variables also include measures of teenage employment and hours worked in the retail industry (TRETAIL, TRHOURS, TSHOURSW) and in small businesses (TSMALL, TSHOURS, TSHOURSW).

Over the period 1979-2004, the mean ratio of teenage employment in the retail sector to teenage population was 0.22, representing more than 50 percent of all teenage employment. The mean number of hours per week worked by employed teens in the retail sector was 21.6 hours (natural log equal to 3.07).

From March 1989 to March 2005, the ratio of teenagers employed in franchises with 100

or fewer employees to teenage population was 0.27. A measure of annual hours worked is constructed using reports of weeks worked last year and usual hours worked per week. Among all teens, the average annual hours worked in small businesses is 195 hours (natural log of 5.27); among teens employed in small businesses, the average annual hours worked is 731 hours (natural log of 6.59).

Also included in Table 1 are the weighted means and standard deviations of the control variables, identical to those used in Card and Krueger (1995) and by Burkhauser et al. (2000). The central independent variable of interest is the natural log of the greater of the state or federal minimum wage. Economic and demographic variables believed to influence retail or small business employment include the mean wage rate of prime-age working adults, the share of teenagers in the overall population, and the overall unemployment rate of prime-age males. Other control variables include seasonal adjustments (month effects), which are especially important for teenagers who are more likely to work over the summer months and over holiday breaks than at other times of the year. Recession dummies are included as an alternative macroeconomic control to year effects in some models.[8] Several different models are estimated to show whether the results are sensitive to choice of macroeconomic control variables, the inclusion of lagged minimum wages, and nonlinear effects of minimum wages. All models presented are weighted by the overall state population, and include state effects to control for time-invariant state-level unobserved heterogeneity.

Appendix A shows state minimum wages that were higher than the federal minimum wage on January 1 of each year from 1979 to 2005. In 2005, 14 states had minimum wages that were higher than the federal minimum wage level of $5.15 per hour. Since the last federal minimum wage increase, there have been many increases in state minimum wages. Not only are a greater number of states implementing minimum wages higher than the federal minimum (i.e., 10 states in 1995 vs. 14 states in 2005), but the states that are implementing higher minimum wages are choosing minimum wage levels that are increasingly higher than the federal minimum.[9]

Empirical Findings

Overall Retail and Small Business Employment.

Table 2 presents estimates of the effect of state minimum wage increases on the share of individuals aged 16-64 who are employed in retail jobs (columns 1-4) or in small businesses (columns 5-8). Estimates on retail employment are obtained using the full state-month panel of 15,861 observations from January 1979 to December 2004. Estimates on small business employment are obtained using state-year observations from March 1989 to March 2005.

The findings in columns (1)-(4) suggest consistent evidence that increases in state minimum wages are associated with declines in retail employment. Model (1) presents fixed effects estimates, model (2) corrects for heteroskedastic and autocorrelated errors[10], model (3) controls for state-specific changes in the overall prime-age adult male (age 25-54) unemployment rate, and model (4) controls for state-specific linear time trends to capture linear trends in unobserved state-specific characteristics. Across each specification, the evidence is consistent: a 10 percent increase in state minimum wages decreases the share of 16-64-year-olds employed in the retail industry by 1 to 3 percent. This finding is consistent with neoclassical economic theory, which predicts that price floors cause unemployment among low-skilled workers, and contradicts the FPI report's finding that a minimum wage hike *increased* retail employment.

In columns (5)-(8) of Table 2, estimates of the effect of state minimum wage increases on the share of individuals aged 16-64 employed in small businesses are presented. Employment in small businesses is defined as those working at a business with fewer than 100 employees employed at any location. As discussed above, information on employer size is only available annually in the March CPS beginning in the late 1980s. A panel of 51 states[11] and 16 years between 1989 and 2005 is used to estimate the effect of minimum wage increases on teen employment in small businesses. The use of annual data over this limited time interval reduces the power of the evaluation design due to (i) the reduction in sample size from more than 16,000 to 867 and (ii) elimination of state-specific monthly variation in minimum wage policies. Despite this reduction in statistical power, across each of these specifications, there is consistent evidence that a 10 percent increase in the minimum wage is associated with a 1 percent decline in small business employment. Again, this finding is in contrast to the FPI report, which found no adverse effects of minimum wage hikes on small business employment.

Taken together, the findings in Table 2 suggest that despite the FPI report's claim, there is no such thing as a free lunch. More careful statistical models with more complete data suggest that minimum wage hikes come at a price: unemployment of workers in retail and small businesses. There are three key reasons why the current study's findings are more credible than those presented in the FPI report. First, the econometric model used in this study is more appropriate than the simple "difference-in-difference" framework used by the authors of the FPI study.[12] While the FPI study did not control for any changes in the economic environment that could be correlated with both states' decisions to implement the minimum wage and with employment outcomes, this study controls for several state-specific changes in economic conditions, as well as national macroeconomic trends. Second, this study has greater statistical power than the FPI study because of a significantly larger number of observations over a longer period of time (more than 16,000 state-month observations) and greater within-state variation in minimum wages. The greater statistical power allows a greater ability to detect significant effects of minimum wage increases on employment.

In addition to the limited statistical power of the evaluation design, the FPI study grouped skilled and unskilled workers together to examine the effect of the minimum wage on overall retail and small business employment. Thus, an important limitation of the FPI report is that it does not specifically focus on the effects of minimum wage hikes on the employment of low-skilled workers. One would not expect that employment of skilled workers in retail or small businesses would be directly affected by minimum wage hikes. Taken together with the limited power of the study's design, it is not surprising that the researchers failed to detect significant adverse effects of minimum wage hikes on overall employment. The evidence presented here, however, suggests that minimum wage hikes do have important disemployment effects in both retail and small businesses.

In fact, the estimates presented in Table 2 may actually understate the adverse effects of minimum wage increases on low-skilled workers to the extent that overall employment rates include skilled laborers. This study next turns to a group of low-skilled workers who have often been examined in the minimum wage literature —teenagers. Minimum wage increases are expected to have their strongest adverse effects on low-skilled workers employed in retail and small businesses.

Before examining the effect of minimum wage increases on teenage employment and

hours worked in the retail and small business sectors, the effects of minimum wage hikes on teenage wage rates and on overall teen employment are examined. If minimum wage increases are expected to influence teenage retail and small business employment, it is important to examine first whether minimum wage increases affect overall teenage employment.

Teenage Wage Effects. Columns (1)-(3) of Table 3 present evidence on the effect of minimum wage increases on the mean hourly wage rates of employed teenagers. Effects on wages must be observed if we are to expect employment effects. These models estimate the relationship between the natural log of the minimum wage and the natural log of the mean hourly teen wage rate. In the specification in column (1), the results show that minimum wage increases are associated with a significant increase in teenage wage rates. This result persists in model (2) when recession dummies are included to control for economic trends in the national economy. Finally, in model (3), year effects are included to control for year-specific unobserved characteristics. The magnitude of the minimum wage effect falls by more than 50 percent but remains statistically significant. These findings confirm results in the existing empirical literature (see, for example, Burkhauser et al., 2000). Minimum wage increases positively affect the average hourly wage rates of teenagers who remain employed, with wage elasticities ranging from 0.159 to 0.498.

Overall Teenage Employment Effects.

In columns (4)-(6) of Table 3, estimates of the effect of minimum wage increases on the ratio of teenage employment to teenage population are presented. Across all model specifications, there is consistent evidence that minimum wage increases are associated with a decline in the teenage employment ratio. Controlling for the average adult wage rate, the share of teens in the state, the prime-age adult male unemployment rate, seasonal employment trends, unobserved time-invariant state characteristics, and year effects, an increase in the minimum wage is consistently associated with a decline in teen employment. A 10 percent increase in the minimum wage is associated with a 2.2 to 3.0 percent decline in the ratio of teenagers who are employed. This finding is generally consistent with the results obtained by Abowd et al. (2004), Burkhauser et al. (2000), Deere et al., (1995), and Neumark and Wascher (1994).

In Table 4, we examine whether these results persist if there are autocorrelated errors, lagged minimum wage effects, and nonlinear effects of minimum wage increases.[13] Across all models, there is consistent evidence that minimum wage increases reduce the employment of teenagers. Models (1)-(3) continue to assume a contemporaneous relationship between the minimum wage and teenage employment. Whether macroeconomic trends are controlled for via a recession dummy (model 2) or year effects (model 3), minimum wage hikes have adverse employment effects for teens. A 10 percent increase in the minimum wage is associated with a 1.8 to 3.0 percent decline in the ratio of teens who are employed.

In models (4)-(6), lagged minimum wage effects are permitted. Included in each model is a measure of the state minimum wage one year prior to the contemporaneous employment rate. The elasticities[14] presented in these models are long-run elasticities. The lagged minimum wage effect is included because firms might not instantaneously respond to increases in the price of low-skilled labor. When these lagged effects are permitted, the estimated long-run elasticity is slightly higher than the short-run elasticity estimated in the previous models. A 10 percent increase in the minimum wage is associated with a 2.5 to 3.3 percent decrease in the ratio of employed teenagers.

In models (7)-(8), dummy variables for each state and federal minimum wage are included to allow the minimum wage to have a nonlinear effect on teenage employment, as in Deere et al. (1995). Dummy variables are created for each of the 55 federal and state minimum wages from January 1979 to December 2004, and include all but a dummy variable for $3.35, the federal minimum wage from 1981 to 1989. The coefficients and elasticities for the federal minimum wage rates of $4.25 and $5.15 are reported in the table[15]. As in the previous models, an increase in the minimum wage is found to significantly decrease the employment of teenagers.

The results in Table 4 provide consistent evidence that minimum wage increases are associated with significant declines in the ratio of teenage employment to teenage population. These findings are consistent with much of post-Card and Krueger minimum wage literature (see, for example, Deere et al., 1995; Burkhauser et al., 2000).[16]

Effect on Teenage Hours Worked.

Table 5 presents estimation results on the effect of minimum wage hikes on average weekly hours worked. This is an important outcome of interest since employers can respond to minimum wage hikes not only by reducing the employment of new teenagers and laying off existing workers but also by reducing the hours of existing employees. In columns (1)-(5), the effect of minimum wage increases on average hours worked by all teenagers is presented. Estimates of the effect of minimum wage increases on average hours worked by all teenagers include the total effect of minimum wage hikes on both employment and hours worked by employed teens. Teenagers who do not work contribute zero work hours in the calculation of the state-month specific measure of average hours worked.

Model (1) includes a recession effect rather than year effects to control for macroeconomic conditions, model (2) uses year effects, models (3) and (4) permit lagged minimum wage effects, and model (5) permits a nonlinear relationship between the minimum wage and average hours worked. Across each of these specifications, there is consistent evidence that minimum wage increases reduce average weekly hours worked by teenagers. A 10 percent increase in the minimum wage is associated with a 3.7 to 4.5 percent reduction in average weekly hours worked by teens. This finding reflects, in part, that minimum wage hikes reduce teen employment (resulting in more teens with zero hours worked). However, as models (6)-(10) show, this finding also suggests that minimum wage increases may reduce hours worked among those who are employed.

The dependent variable used in models (6)-(10) is the natural log of average hours worked by *employed* teenagers.[17] There is fairly consistent evidence that minimum wage increases reduce hours worked by teenagers who are employed. This finding is especially strong in models that use a recession effect to control for macroeconomic trends (models 6, 8, and 10).[18] The estimates obtained in models (6) and (8) reflect that a 10 percent increase in the minimum wage is associated with a 2.9 percent decline in average hours worked by employed teenagers.

Taken together, the results in Tables 3-5 suggest strong evidence that minimum wage hikes continue to have adverse effects on teenage employment and hours worked. Contrary to recent claims by some minimum wage advocates, minimum wage increases are associated with a reduction in employment and hours worked among low-skilled workers. In the remaining tables, we once again turn specifically to the claim made in the FPI study—that raising the minimum wage has no adverse employment effects on low-skilled workers in retail or small businesses.

Teenage Retail Sector Employment.

Given that teenagers often select jobs in the retail sector, such low-skilled workers are likely to be hardest hit by minimum wage hikes. As noted above, the majority (51 percent) of employed teenagers worked in the retail sector.

Table 6 presents the effect of minimum wage hikes on the ratio of teenagers employed in the retail sector, on average retail hours worked by all teenagers (including nonworkers), and on average retail hours worked by teenagers employed in retail jobs. Each of the models is corrected for heteroskedastic and autocorrelated residuals. Columns (1)-(4) present employment effects. There is consistent evidence that minimum wage increases reduce the proportion of teenagers employed in the retail industry. A 10 percent increase in the minimum wage is associated with a 2.7 to 4.3 percent decline in the employment of teenagers in the retail sector. This finding is robust across all model specifications. This effect is larger than the effect of minimum wage increases on the overall retail employment, reflecting that low-skilled workers are, as expected, most adversely affected.

Models (5)-(7) in Table 6 show the effect of minimum wage increases on average retail hours worked by all teenagers. These estimates capture the total effect of minimum wage increases on both retail employment and on hours worked by teenagers employed in retail businesses.[19] These models show that a 10 percent increase in the minimum wage is associated with a 5 percent decline in average hours worked in the retail sector. The results in columns (8)-(10) suggest that while the reduction in retail hours can be partially explained by disemployment effects, minimum wage increases may also decrease mean hours worked by teenagers working in the retail sector. In models that use a recession dummy to control for macroeconomic trends (columns 8 and 10), there is evidence of a significant negative relationship between minimum wage increases and retail hours worked among teens *employed* in the retail sector. A 10 percent increase in the minimum wage is associated with a 2.8 percent decline in retail hours worked among teens employed in retail businesses. However, the model including year effects (column 9) finds a negative, but insignificant, relationship between minimum wage increases and hours worked among employed teens.

In summary, the results in Table 6—along with the findings in columns (1)-(4) of Table 2—provide strong evidence that minimum wage increases have adverse effects on employment and hours worked of low-skilled retail workers.

Teenage Small Business Employment.

The effect of minimum wage increases on teenage small business employment is examined in Table 7. Due to the limited power of the evaluation design, the choice of macroeconomic controls (year effects vs. recession effects) is likely to have a greater influence over these estimates. This is because the year effects will capture all changes in the federal minimum wage. Moreover, given that the data are less precisely measured (annual data vs. monthly data) than those data used for the previous models, lagged minimum wage effects may be more important in these specifications.

Columns (1)-(4) present estimates of the relationship between minimum wage increases and the ratio of teenagers employed in small businesses. Across all model specifications, there is consistent evidence that an increase in the minimum wage is associated with a significant reduction in teenage small business employment. A 10 percent increase in the minimum wage is associated with a 4.6 to 9.0 percent reduction in the ratio of teenagers employed in small businesses.

In columns (5)-(7), estimates of the effect of minimum wage increases on average teenage hours worked in small businesses are presented. Across each of these models, an increase in the minimum wage is associated with a decline in average small business hours worked by all teenagers. A 10 percent increase in the minimum wage is associated with a 4.8 to 8.8 percent reduction in average hours worked. The findings in columns (8)-(10) suggest that among teenagers who work in small businesses, average hours worked may be adversely affected by minimum wage increases. However, the adverse effects do not appear to occur contemporaneously, but rather are lagged effects. In model (8), the estimate reflects that a 10 percent increase in the minimum wage is associated with a 5.6 percent reduction in average hours worked among teens who are *employed* in small businesses. However, the negative effects appear to be strongest in the period following the implementation of the minimum wage.[20] That is, the previous year's minimum wage has an important adverse effect on hours worked during the current year. A likely explanation for this finding is that the use of annual data reduces the precision of the evaluation design; that is, analyzing mid-year changes in state or federal minimum wages may not have their full effects until the following year.

Along with the findings in columns (5)-(8) of Table 2, the results in Table 7 paint a picture quite different from that of the FPI report, which concluded that there were no adverse employment effects of minimum wage hikes on small businesses. When more appropriate statistical methods are used, and the dependent variable is more carefully defined, important adverse employment effects are detected. As expected, the magnitude of the disemployment effect is larger for teenage small business employment than for overall small business employment.

Conclusions

This study has examined the impact of minimum wage increases on retail and small business employment, with special attention to employment by a group of low-skilled workers—teenagers—employed in retail and small businesses. These findings provide consistent evidence that minimum wage increases result in a significant decline in retail and small business employment. This finding is robust across several model specifications. A 10 percent increase in state minimum wages is consistently associated with a 1 percent reduction in retail employment and a 1 percent reduction in small business employment.

Minimum wage hikes are associated with an even larger reduction in teenage employment in the retail sector, with elasticities ranging from -0.267 to -0.429. Moreover, a 10 percent increase in the minimum wage reduces average retail hours worked by 5 percent, and, among teens who remain employed in the retail sector, reduces average hours worked by 2 to 3 percent. Finally, teen employment in small businesses is negatively affected by minimum wage hikes. A 10 percent increase in the minimum wage is associated with a 4.6 to 9.0 percent decline in teenage employment in small businesses and a 4.8 to 8.8 percent reduction in hours worked by teens in the retail sector.

Taken together with other recent work (Abowd, Kramarz, Lemieux, and Margolis, 2004; Burkhauser, Couch, and Wittenburg, 2000a; Burkhauser, Couch, and Wittenburg, 2000b; Deere, Murphy, and Welch, 1995; Neumark and Wascher, 1994), the findings of this study suggest that low-skilled workers will not escape adverse labor market consequences resulting from minimum wage increases. Moreover, the results of this study suggest that the findings from the Fiscal Policy Institute report

(2004) are misleading. Raising the minimum wage has negative effects on the employment and hours worked of low-skilled workers, particularly in the retail sector and in small businesses. This finding is consistent with standard neoclassical economic theory, which suggests that if the price of low-skilled labor rises, employers will reduce the numbers of low-skilled employees, reduce the hours offered to currently employed low-skilled employees, or both.

In addition to the adverse employment effects of the minimum wage, there are other important reasons why raising the minimum wage is a poor policy strategy. Modern-day minimum wage hikes are no longer an effective means of reducing poverty among the working poor (Burkhauser, Couch, and Wittenburg, 1996; Burkhauser and Finegan, 1989; Burkhauser and Harrison, 1999; Burkhauser and Sabia, 2004). This is true for two reasons. First, most minimum wage workers now live in nonpoor households because they are second or third earners in a family, such as teenage dependents. Second, most workers from poor households earn wage rates higher than the minimum wage. Hence, raising the minimum wage is not target efficient at reducing poverty among the working poor. As Burkhauser et al. (1996) show, the Earned Income Tax Credit (EITC) is a far more effective policy tool to reduce poverty among poor families. Moreover, the EITC has the advantage of avoiding the adverse employment effects described in this study. In fact, Neumark et al. (2002) show that a minimum wage hike may actually increase the poverty rate because the increase's adverse effect on hours worked will push nonpoor families into poverty.

The findings of this study should serve as a caution to legislators considering an increase in the minimum wage. While the findings of the FPI study may be seductive to some policymakers, the evidence presented here should serve as a reminder that there is no such thing as a free lunch. Raising the minimum wage will hurt rather than help low-skilled workers in retail and small businesses.

Endnotes

1. Burkhauser, Couch, and Wittenburg (2000a) find that the anomalous Card and Krueger (1995) results using the CPS can be explained by the authors' choice of macroeconomic controls. Card and Krueger's use of year effects to control for macroeconomic trends captures all of the federal variation in minimum wages; thus, given the small amount of identifying variation left in state-specific minimum wages, it is not surprising that they find insignificant effects of minimum wage increases. When Burkhauser et al. (2000) use alternate macroeconomic controls that do not capture all of the variation in federal minimum wage increases, they find significant negative effects of minimum wage increases on teenage employment.

2. This final control is accomplished through the use of state fixed effects.

3. Most of the models presented are corrected for panel-level heteroskedasticity and first-order autocorrelation, i.e. $\varepsilon \sim (0, \sigma_i^2)$; $\varepsilon_{it} = \rho \varepsilon_{it-1} + \upsilon$, via Prais-Winsten feasible generalized least squares estimation with panel-corrected standard errors.

4. One alternate specification, suggested by Burkhauser et al. (2000), uses a recession dummy variable to capture national macroeconomic trends rather than year effects. A specification of this form will allow identifying variation to come from changes in the federal minimum wage as well as state minimum wages, rather than just changes in state-specific minimum wages. If this alternate specification is adopted, then the estimate of can be interpreted as the effect of the higher of the state or federal minimum wage. This permits identifying variation from changes in the federal minimum wage as well as state minimum wages. Another specification permits state-specific linear time trends to capture linear trends in unobserved state-specific characteristics.

5. Data from November 2004 are not available.

6. Comparable measures of retail employment were created during the period when the CPS switched from the Standard Industrial Classification (SIC) system to the North American Industry Classification System (NAICS). Thanks to Jean Roth at NBER for assistance with creating comparable measures of retail employment.

7. Given available data in the CPS, I could not replicate the 50 employee threshold used in the FPI study (2004).

8. In these models, variation in the federal minimum wage (in addition to variation in state minimum wages) is permitted to affect employment.

9. The mean state minimum wage among states with minimum wages higher than the federal minimum was 13 percent higher that the federal minimum in 1995 and 28 percent higher than the federal minimum in 2005.

10. Failing to correct for autocorrelation when it is, in fact, present could result in depressed standard errors. This would

11. This includes the District of Columbia.

12. More precisely, the identification strategy is more credible.

13. Each model is estimated via feasible generalized least squares (FGLS) models using the Prais-Winsten method of autocorrelation correction and with state-specific, panel corrected standard errors.

14. This is the sum of the contemporaneous and one-year lagged effect.

15. Estimates for other coefficients are available upon request of the author.

16. Burkhauser et al. (2000) could not identify significant effects of minimum wage hikes when including year dummies in their models because these dummies captured much of the identifying variation in minimum wages, specifically that from changes in the federal minimum wage. The results presented here reflect that because of significant variation in state minimum wage policies from 1997-2005, significant effects of state minimum wage policies can be estimated.

17. Teenagers who contribute to mean hours worked by employed teens (HOURSW) have positive number of hours worked last week. The denominator includes only those who are employed. This is in contrast to the previous measure of average hour worked (HOURS), which include work hours of all teenagers in the calculation; the denominator in the HOURS measure includes all teenagers.

18. One explanation for why the finding is not as strong in models that use year effects is that these year effects capture much of the identifying variation in the minimum wage needed to find significant effects on hours worked by employed teens.

19. As before, teenagers who report no employment in a retail job are coded as working for zero hours.

20. While contemporaneous minimum wage is actually positive and significant, indicating a short-run positive effect of minimum wage hike, the long-run effect, which includes both the contemporaneous and lagged minimum wage effect, is negative and large.Thus, a specification that did not consider the importance of large negative lagged minimum wage effects would erroneously conclude that minimum wage increases actually increased employment.

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Table 1: Means and Standard Deviations of Variables (January 1979 - December 2004)

Variable Name	Definition	Mean (StD)
Dependent Variables		
ORETAI	Ratio of overall (ages 16-64) retail employment (last week) to population aged 16-64	0.11 (0.02)
OSMALL[2]	Ratio of overall (ages 16-64) small business employment (last year) to population aged 16-64	0.34 (0.04)
TEMPLOY	Ratio of teenage (ages 16-19) employment (last week) to teenage population	0.42 (0.12)
TEENWAGE	Natural log of wage of employed teenagers	1.63 (0.27)
THOURS	Natural log of average weekly hours worked by all teenagers	2.26 (0.40)
THOURSW	Natural log of average weekly hours worked by employed teenagers (ages 16-19)	3.15 (0.21)
TRETAIL[1]	Ratio of teenage (ages 16-19) employment in retail sector to teenage population	0.22 (0.08)
TRHOURS[1]	Natural log of average weekly retail hours worked by all teenagers	1.48 (0.47)
TRHOURSW[1]	Natural log of average weekly hours worked by teenagers employed in retail sector	3.07 (0.25)
TSMALL[2]	Ratio of teenage (ages 16-19) employment at any time during last year in small-size firm (<100 employees) to teenage population	0.28 (0.08)
TSHOURS[2]	Natural log of average annual small business hours worked by all teenagers	5.27 (0.33)
TSHOURSW[2]	Natural log of average annual hours worked by teenagers employed in small businesses	6.59 (0.16)
Independent Variables		
MINWAGE	Natural log of higher of state or federal minimum wage	1.42 (0.21)
ADULTWAGE	Natural log of the wage rate of workers aged 25-54	2.46 (0.30)
SHARETEEN	Proportion of population aged 16-64 who are teenagers (aged 16-19)	0.09 (0.02)
AUNEM	Unemployment rate of males aged 25-54	0.05 (0.03)
RECESSION	Dummy variable equal to one in the month in which the economy was officially in a recession	0.12 (0.32)
State Effects	Dummy variable equal to one for each state	---
Seasonal Effects	Dummy variable equal to one for each month in the year	---
Year	Dummy variable equal to one for each year	---
Number of states[3]		51
N		15,861

SOURCE: Computed by the author with monthly CPS data from the outgoing rotation group.

[1]Consistent data on retail employment for teenagers available for 15,859 observations.

[2]Data on firm size are available annually in the March CPS beginning in 1989; N = 867.

[3]Includes the District of Columbia

Table 2: Effect of Minimum Wage on Ratio of Employment in Retail and Small Businesses to Population (Age 16-64)

	ORETAIL				OSMALL			
	1	2	3	4	5	6	7	8
MINWAGE	-0.011***	-0.009**	-0.010***	-0.032***	-0.028***	-0.038***	-0.040***	-0.028***
	(0.003)	(0.004)	(0.004)	(0.002)	(0.008)	(0.006)	(0.006)	(0.008)
ADULTWAGE	-0.039***	-0.041***	-0.041***	-0.049***	0.009	0.004	-0.005	-0.003
	(0.002)	(0.003)	(0.002)	(0.002)	(0.009)	(0.010)	(0.010)	(0.008)
SHARETEEN	0.083***	0.088***	0.087***	0.090***	-0.024	-0.002	0.015	0.203***
	(0.009)	(0.010)	(0.010)	(0.009)	(0.070)	(0.066)	(0.065)	(0.061)
AUNEM	---	---	-0.039***	-0.012***	---	---	-0.168***	-0.082***
			(0.007)	(0.006)			(0.031)	(0.030)
Seasonal Effects	Yes	Yes	Yes	Yes	---	---	---	---
State Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	No	Yes	Yes	Yes	No
State Linear Time Trend	No	No	No	Yes	No	No	No	Yes
Prais-Winsten	No	Yes	Yes	Yes	No	Yes	Yes	Yes
N	15,861	15,867	15,867	15,867	867	867	867	867
Elasticity	-0.101	-0.085	-0.092	-0.290	-0.081	-0.113	-0.116	-0.081

SOURCE: Computed by the author.

Dependent variable in models (1)-(4) is the ratio of 16-64 year-olds employed in retail industry.
Dependent variable in models (5)-(8) is ratio of of 16-64 year-olds employed in small businesses.
**** Significant at 1% level ** Significant at 5% level * Significant at 10% level*

Table 3: **Effect of Minimum Wage on Average Teenage (Ages 16-19) Wage Rates and Ratio of Teenage Employment to Teenage Population, January 1979 - December 2004**

	TEENWAGE			TEMPLOY		
	1	2	3	4	5	6
MINWAGE	0.498***	0.496***	0.159***	-0.094***	-0.092***	-0.126***
	(0.015)	(0.015)	(0.026)	(0.010)	(0.010)	(0.019)
ADULTWAGE	-0.039***	-0.041***	-0.041***	-0.049***	0.009	
	(0.002)	(0.003)	(0.002)	(0.002)	(0.009)	
SHARETEEN	0.134*	0.119	-0.003	-0.027	-0.017	0.007
	(0.081)	(0.081)	(0.085)	(0.054)	(0.054)	(0.054)
AUNEM	-0.445***	-0.453***	-0.166***	-0.853***	-0.847***	-0.548***
	(0.052)	(0.051)	(0.052)	(0.032)	(0.032)	(0.035)
RECESSION	---	0.009**	---	---	-0.006**	---
		(0.003)			(0.002)	
Seasonal Effects	Yes	Yes	Yes	Yes	Yes	Yes
State Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	No	No	Yes	No	No	Yes
R^2	0.788	0.788	0.802	0.463	0.463	0.487
N	15,861	15,861	15,861	15,861	15,861	15,861
Elasticity	-0.498	0.496	0.159	-0.222	-0.217	-0.298

SOURCE: Computed by the author.

Dependent variable in models (1)-(3) is natural log of the average teenage wage rate.
Dependent variable in models (4)-(6) is ratio of employed teenagers to teenage population.
**** Significant at 1% level ** Significant at 5% level * Significant at 10% level*

Table 4: Prais-Winsten FGLS Estimates of Impact of Minimum Wage on Ratio of Teenage (Ages 16-19) Employment to Teenage Population (January 1979 - December 2004)

	1	2	3	4	5	6	7	8
MINWAGE $4.25[1]	—	—	—	—	—	—	-0.011***	-0.011***
							(0.004)	(0.004)
MINWAGE $5.15[1]	—	—	—	—	—	—	-0.015	-0.012
							(0.006)	(0.006)
MINWAGE	0.080***	-0.078***	-0.127***	-0.007	0.002	-0.094***	---	---
	(0.009)	(0.010)	(0.010)	(0.009)	(0.070)	(0.066)	(0.065)	(0.061)
LAG MINWAGE (1 YR)	---	---	---	-0.101***	-0.108***	-0.044	---	---
				(0.027)	(0.027)	(0.031)		
ADULTWAGE	-0.007	-0.010	-0.001	0.019	0.016	0.002	-0.019*	-0.025**
	(0.009)	(0.009)	(0.014)	(0.011)	(0.011)	(0.014)	(0.011)	(0.011)
SHARETEEN	-0.007	0.005	0.037	-0.020	-0.008	0.031	-0.002	0.009)
	(0.051)	(0.051)	(0.051)	(0.053)	(0.053)	(0.053)	(0.051)	(0.051)
AUNEM	-0.711***	-0.704***	-0.454***	-0.685***	-0.682***	-0.462***	-0.663***	-0.658***
	(0.037)	(0.037)	(0.038)	(0.038)	(0.038)	(0.038)	(0.037)	(0.037)
RECESSION	---	-0.008**	---	---	-0.008**	---	---	-0.010***
		(0.004)			(0.004)			(0.004)
Seasonal Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	No	No	Yes	No	No	Yes	No	No
N	15,861	15,861	15,861	15,249	15,249	15,249	15,861	15,861
Elasticity	-0.189	-0.184	-0.300	-0.255	-0.250	-0.326	---	--

SOURCE: Computed by the author.

[1]Relative to $3.35 federal minimum wage level.

Dependent variable in each model is the ratio of teenage employment to teenage population

**** Significant at 1% level ** Significant at 5% level*

Table 5: Prais-Winsten FGLS Estimates of Effect of Minimum Wage on Average Hours Worked by Teenagers, January 1979 - December 2004

	THOURS					THOURSW				
	1	2	3	4	5	6	7	8	9	10
Min Wage $4.25[1]	---	---	---	---	-0.079***	---	---	---	---	-0.067***
					(0.015)					(0.009)
Min Wage $5.15[1]	---	---	---	---	-0.130***	---	---	---	---	-0.110***
					(0.023)					(0.013)
MINWAGE	0.454***	-0.371***	-0.141	-0.377***	---	-0.287***	-0.039	-0.146***	-0.111**	---
	(0.045)	(0.070)	(0.093)	(0.103)		(0.286)	(0.038)	(0.054)	(0.057)	
LAG MINWAGE	---	---	-0.373***	0.011	---	---	---	-0.142***	0.099	---
(1 YR)			(0.095)	(0.110)				(0.056)	(0.061)	
ADULTWAGE	-0.101***	-0.050	-0.055	-0.048	-0.173***	-0.087***	-0.045	-0.097***	-0.049*	-0.123**
	(0.032)	(0.047)	(0.037)	(0.049)	(0.038)	(0.019)	(0.027)	(0.022)	(0.028)	(0.022)
SHARETEEN	0.892***	1.00***	0.931***	1.03***	0.935***	0.587***	0.620***	0.638***	0.638***	0.586***
	(0.173)	(0.174)	(0.179)	(0.180)	(0.174)	(0.102)	(0.102)	(0.106)	(0.106)	(0.102)
AUNEM	-2.01***	-1.43***	-2.01***	-1.46***	-1.93***	-0.259***	-0.293***	-0.296***	-0.298***	-0.296***
	(0.128)	(0.128)	(0.131)	(0.131)	(0.126)	(0.075)	(0.073)	(0.077)	(0.075)	(0.074)
RECESSION	-0.001	---	-0.007	---	-0.018	0.018**	---	0.012	---	0.014
	(0.013)		(0.013)		(0.013)	(0.008)		(0.008)		(0.008
Seasonal Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	No	Yes	No	Yes	No	No	Yes	No	Yes	No
N	15,861	15,861	15,249	15,249	15,861	15,861	15,861	15,249	15,249	15,861

SOURCE: Computed by the author.

Dependent variable in each model is the natural log of the average hours worked.
[1]Relative to $3.35 federal minimum wage level. All other minimum wage levels were included in models (5) and (10) and are available upon request of the author.

**** Significant at 1% level ** Significant at 5% level * Significant at 10% level*

Table 6: Prais-Winsten FGLS Estimates of Impact of Minimum Wage on Ratio of Teen age (Ages 16-19) Retail Employment to Teenage Population and on Average Hours Worked, January 1979 - December 2004

	TRETAIL				TRHOURS			TRHOURSW		
	1	2	3	4	5	6	7	8	9	10
Min Wage $4.25[1]	---	---	---	0.001	---	---	-0.074***	---	---	-0.067***
				(0.003)			(0.019)			(0.010)
Min Wage $5.15[1]	---	---	---	-0.011**	---	---	-0.171***	---	---	-0.106***
				(0.004)			(0.028)			(0.015)
MINWAGE	-0.058***	-0.087***	-0.069***	---	-0.530***	-0.502***	---	-0.204***	-0.107	---
	(0.009)	(0.016)	(0.023)		(0.099)	(0.146)		(0.058)	(0.069)	
LAG MINWAGE	---	---	-0.024	---	---	-0.021	---	-0.075	0.061	---
(1 YR)			(0.025)			(0.155)		(0.060)	(0.074)	
ADULTWAGE	0.052***	0.015	0.014	0.032***	0.057	0.056	0.078	-0.054	-0.068*	-0.084***
	(0.007)	(0.011)	(0.011)	(0.008)	(0.068)	(0.070)	(0.049)	(0.025)	(0.036)	(0.025)
SHARETEEN	-0.251***	-0.155***	-0.158***	-0.199***	0.361	0.372	0.157	0.523***	0.586***	0.472***
	(0.041)	(0.042)	(0.043)	(0.042)	(0.259)	(0.267)	(0.256)	(0.138)	(0.140)	(0.135)
AUNEM	-0.395***	-0.270***	-0.273***	-0.418***	-1.49***	-1.52***	-2.14***	-0.157*	-0.186*	-0.173*
	(0.028)	(0.030)	(0.030)	(0.028)	(0.181)	(0.185)	(0.174)	(0.095)	(0.096)	(0.091)
RECESSION	-0.006**	---	---	-0.007***	---	---	-0.036**	0.005	---	-0.004
	(0.003)			(0.003)			(0.016)	(0.009)		(0.008)
Seasonal Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	No	Yes	Yes	No	Yes	Yes	No	No	Yes	No
N	15,859	15,859	15,249	15,859	15,859	18,249	18,589	15,249	18,249	18,859
Elasticity	-0.267	-0.401	-0.429	---	-0.530	-0.523	---	-0.279	-0.046	---

SOURCE: Computed by the author.

Dependent variable in models (1)-(4) is the ratio of teenage retail employment to teenage population. The dependent variable in the remaining models is the natural log of the average hours worked.

[1]Relative to $3.35 federal minimum wage level. All other minimum wage levels were included in models (4), (7), and (10) and are available upon request of the author.

**** Significant at 1% level ** Significant at 5% level * Significant at 10% level*

Table 7: Prais-Winsten FGLS Estimates of Impact of Minimum Wage on Ratio of Teenage (Ages 16-19) Small Business Employment to7 Teenage Population and on Average Hours Worked, March 1989 - March 2005

	TSMALL				TSHOURS			TSHOURSW		
	1	2	3	4	5	6	7	8	9	10
Min Wage $4.25[1]	---	---	---	-0.054***	---	---	-0.188***	---	---	-0.086**[2]
				(0.010)				(0.032)		(0.030)
Min Wage $5.15[1]	---	---	---	-0.087***	---	---	-0.281***	---	---	0.034[2]
				(0.032)			(0.091)			(0.041)
MINWAGE	-0.246***	-0.185***	-0.196***	---	-0.478***	-0.431***	---	0.268***		---
	(0.013)	(0.020)	(0.019)		(0.108)	(0.113)		(0.073)		
LAG MINWAGE (1 YR)	---	---	0.071	---	---	-0.406	---	-0.809***	-0.697***	---
			(0.044)			(0.280)		(0.163)	(0.153)	
ADULTWAGE	-0.000	0.001	0.001	-0.000	-0.008	-0.007	-0.011**	-0.009***	-0.009***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.005)	(0.006)	(0.005)	(0.003)	(0.003)	(0.002)
SHARETEEN	0.900***	0.570***	0.594***	1.36***	0.912	0.952	3.88***	-1.53**	-0.806	-1.93***
	(0.174)	(0.201)	(0.201)	(0.167)	(0.963)	(0.995)	(1.17)	(0.612)	(0.592)	(0.597)
AUNEM	-0.134	0.320***	0.312***	-0.064	0.156	0.191	-2.31***	-0.186	-0.256	-0.132
	(0.097)	(0.101)	(0.101)	(0.079)	(0.784)	(0.789)	(0.810)	(0.448)	(0.447)	(0.397)
RECESSION	-0.027**	---	---	-0.008	---	---	---	---	---	-0.048
	(0.013)			(0.011)						(0.050)
Seasonal Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
N	867	867	867	867	867	867	867	867	867	867
Elasticity	-0.885	-0.668	-0.451	---	-0.478	-0.887	---	-0.541	-0.697	---

SOURCE: Computed by the author.

Dependent variable in models (1)-(4) is the ratio of teenage small business employment to teenage population. The dependent variable in the remaining models is the natural log of the average hours worked.

[1]Relative to $3.35 federal minimum wage level. All other minimum wage levels were included in models (4), (7), and (10) and are available upon request of the author.
[2]Coefficients presented are lagged minimum wage effects.
**** Significant at 1% level ** Significant at 5% level * Significant at 10% level*

Appendix — State Minimum Wages from 1979 to 2005 that were Higher than the Federal Minimum on January 1

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
FEDERAL MINIMUM[a]	3.35	3.35	3.35	3.80	4.25	4.25	4.25	4.25	4.25	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15
NORTHEAST																			
New England																			
Maine[b]	3.65	3.65	3.75	3.85	---	---	---	---	---	---	---	---	---	---	---	5.75	6.25	6.25	6.25
New Hampshire	3.45	3.55	3.65	3.75	3.85	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Vermont	3.45	3.55	3.65	3.75	3.85	---	---	---	4.75	4.75	5.00	---	---	5.75	6.25	6.25	6.25	6.75	6.75
Massachusetts	3.55	3.65	3.75	3.75	---	---	---	---	---	---	5.25	---	---	6.00	6.75	6.75	6.75	6.75	6.75
Rhose Island	3.55	3.65	4.00	4.25	4.25	4.45	4.45	4.45	4.45	4.45	5.15	---	---	5.65	6.15	6.15	6.15	6.15	6.15
Connecticut[c]	3.37	3.75	4.25	4.25	4.25	4.27	4.27	4.27	4.27	4.27	4.77	---	5.65	6.15	6.40	6.70	6.90	7.10	7.10
MIDDLE ATLANTIC																			
New Jersey	---	---	---	---	---	5.05	5.05	5.05	5.05	5.05	5.05	---	---	---	---	---	---	---	---
New York	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.00
Pennsylvania	---	---	3.70	3.80	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MIDWEST																			
East North Central																			
Illinois	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.50	6.50
WEST NORTH CENTRAL																			
Minnesota	---	3.55	3.85	3.95	4.25	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Iowa	---	---	---	3.85	4.25	4.65	4.65	4.65	4.65	4.65	---	---	---	---	---	---	---	---	---
SOUTH																			
South Atlantic																			
Delaware	---	---	---	---	---	---	---	---	---	4.65	5.00	---	---	5.65	6.15	6.15	6.15	6.15	6.15
District of Columbia[d]	4.16	4.33	4.33	4.33	4.33	4.33	4.33	5.25	5.25	5.25	5.75	5.75	6.15	6.15	6.15	6.15	6.15	6.15	6.15
East South Central																			
None	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
West South																			
None	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WEST																			
Mountain																			
None	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pacific																			
Washington	---	---	3.85	4.25	4.25	---	---	4.90	4.90	4.90	4.90	---	5.70	6.50	6.72	6.90	7.01	7.16	7.35
Oregon	---	---	---	4.25	4.75	4.75	4.75	4.75	4.75	4.75	5.50	6.00	6.50	6.50	6.50	6.50	6.90	7.05	7.25
California	---	---	4.25	4.25	4.25	---	---	---	---	---	---	5.00	5.75	5.75	6.25	6.75	6.75	6.75	6.75
Pacific (noncontiguous)																			
Alaska[e]	3.85	3.85	3.85	3.85	4.30	4.75	4.75	4.75	4.75	4.75	5.25	5.65	5.65	5.65	5.65	5.65	7.15	7.15	7.15
Hawaii	---	3.85	3.85	3.85	---	4.75	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.75	6.25	6.25	6.25

Source: Updated from Burkhauser et al. (2000), Fiscal Policies Institute (2004), and the U.S. Department of Labor

In 1990 and 1991, the federal minimum wage was not implemented until April 1. Thus, some states listed in the table have a higher state minimum wage than the federal minimum wage from January to March in those years. In 1996 and 1997, the federal minimum wage was not implemented until October 1. Thus, some states listed in the table have a higher state minimum wage than the federal minimum wage from January to September in those years.

[a]The federal minimum wage was $2.90 in 1979, $3.12 in 1980, and $3.37 from 1981 to 1983.
[b]The minimum wage in Maine was $3.45 in 1985 and $3.55 in 1986.
[c]The minimum wage in Connecticut was $2.91 in 1979, $3.12 in 1980, and $3.37 from 1981 to 1986.
[d]The minimum wage in the District of Columbia was was $2.95 in 1979, $3.14 in 1980, $3.48 in 1981, $3.62 from 1983-1984, $3.82 in 184-1985, and $3.86 in 1986.
[e]The minimum wage in Alaska was $3.40 in 1979, $3.60 in 1980, and $3.85 from 1981 to 1986.

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DRAFT

The Effect of Minimum Wage Increases on Single Mothers' Labor Supply, Wage Income, and Poverty[*]

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The Effect of Minimum Wage Increases on Single Mothers' Labor Supply, Wage Income, and Poverty

Abstract

Using pooled cross-section data from the 1990-2005 March Current Population Survey (CPS), this study provides estimates of the effect of minimum wage increases on employment, hours worked, wage income, welfare receipt, and poverty status of single mothers. The results show that while a growing economy, pro-work welfare reforms, and expansions in the Earned Income Tax Credit (EITC) increased the labor supply of unmarried mothers, minimum wage increases had adverse effects on employment. A 10 percent increase in the minimum wage is associated with a 2.4 to 3.8 percent reduction in single mothers' employment. Among single mothers who have not completed high school, the effects are even larger, with elasticities ranging from -0.68 to -1.4. Moreover, minimum wage increases decrease annual hours worked and decrease annual wage income, potentially leading to increased welfare dependency. Comparing the relative effectiveness of the minimum wage and the EITC as antipoverty tools, the evidence shows that a 10 percent increase in the maximum EITC benefit is associated with a 7 to 8 percent reduction in poverty among full-time employed single mothers while minimum wage increases have no significant effect on poverty. In fact, the estimated coefficient is positive in some specifications. Taken together, the evidence in this study suggests that minimum wage increases undermined the pro-work policy goals of welfare reform and EITC expansions.

(JEL: J21, J38, J23)

Introduction

> "[T]he jobs available to women leaving welfare are often minimum wage jobs, and it is difficult, if not impossible, for them to meet the needs of their families and raise their children. Daily life is often harsh for low-income working mothers in all parts of the country, whether or not they have been on welfare. For them, survival is the daily goal. If they work hard enough and their working hours are long enough, they can make ends meet – but only barely….We must stop asking these families to do it all alone. They are working too many hours for too little pay, without access to the support they need to make ends meet and improve the quality of their lives. One of the most important steps we can take is to guarantee a fair minimum wage." - *Senator Edward M. Kennedy (D-MA), May 2005*

While single mothers comprise less than 15 percent of all workers earning between $5.15 and $7.25 per hour (Burkhauser and Sabia, 2005), policymakers advocating a federal minimum wage increase to $7.25 per hour often refer to single mothers as their target population for minimum wage protection. Several studies have demonstrated that most minimum wage workers are not poor, that most workers in poor families earn wage rates higher than the federal minimum, and that even in the absence of adverse employment effects, the minimum wage is a poor policy tool to alleviate poverty because it is not target efficient, relative to the Earned Income Tax Credit (EITC) program (Burkhauser et al., 1996a; Burkhauser and Finegan, 1989; Burkhauser and Harrison; 1999; Burkhauser and Sabia, 2004; 2005).[1] Moreover, recent dynamic analyses that have examined the effect of minimum wage hikes on household-specific flows into and out of poverty have found that minimum wage hikes cause some low-skilled workers to fall into poverty due to adverse employment effects (Neumark and Wascher, 2001,

[1] Using data from the Outgoing Rotation Group of the 2003 Current Population Survey, Burkhauser and Sabia (2005) find that 13 percent of workers earning between $5.15 and $7.24 per hour live in households with income to needs ratios (INR) less than 1.0, while 45 percent live in households with incomes over three times the family-size adjusted federal poverty line. Moreover, 64 percent of workers living in poor families earn wages greater than $7.25 per hour.

2002; Neumark et al., 2005).[2] Despite this empirical evidence, the political rhetoric surrounding minimum wage hikes continues to center on the policy goal of helping single mothers to escape poverty, particularly since the passage of the Personal Responsibility and Work Opportunity Act (PRWORA) of 1996, which provided strong incentives for single mothers to increase labor supply and leave (or remain off of) the welfare rolls.

Much of the literature examining the employment effects of minimum wage hikes have focused on populations of low-skilled workers, usually teenagers and high school dropouts, because these are the populations most likely to be affected by minimum wage increases (Card and Krueger, 1995; Card et al., 1994; Burkhauser, Couch, and Wittenburg, 2000a; Deere, Murphy, and Welch, 1995; Neumark, 2001; Neumark and Wascher, 1992, 2002; Neumark et al., 2004; Partridge and Partridge, 1999; Currie and Fallick, 1996; Williams, 1993; Couch and Wittenburg, 2001; Campolieti et al., 2006; Campolieti et al., 2005). While Card and Krueger (1992), Card et al. (1994) and Card and Krueger (1995) found no evidence that minimum wage increases had adverse effects on teenage employment, these studies have proven to be largely iconoclastic.[3] Much of the recent minimum wage literature has returned a consensus among labor economists that minimum wage increases have modest, adverse effects on employment and hours worked among low-skilled workers and in low-skilled sectors (Campolieti et al., 2006; Campolieti et al., 2005; Burkhauser, Couch, and Wittenburg, 2000a; Deere, Murphy, and Welch, 1995; Neumark, 2001; Neumark and Wascher, 1992, 2002; Neumark et al., 2004;

[2] These studies have found that, on net, minimum wage hikes have little effect or even a positive effect on overall poverty rates, a result consistent with findings by Card and Krueger (1995) and Burkhauser and Sabia (2006).

[3] One line of criticism of the Card and Krueger (1994) fast food study concerns choice of research design (Hamermesh, 1995) and phone survey methodology (Welch, 1995). Criticism of Card and Krueger's CPS-based panel study have focused on the author's interpretation of year effects as well as the availability of sufficient within-state state variation in the minimum wage to estimate policy impacts with sufficient precision (see, for example. Burkhauser et al., 2000a).

Partridge and Partridge, 1999; Currie and Fallick, 1996; Williams, 1993; Couch and Wittenburg, 2001; Sabia, 2006).[4] However, few studies in the minimum wage literature have specifically examined the effects of minimum wage increases on the outcomes of unmarried single mothers.

Several recent studies have examined the effect of such hikes on welfare receipt. Brandon (1995) and Turner (1999) use data from the Survey of Income and Program Participation (SIPP) to estimate the effect of minimum wage increases on the probability of exit from AFDC and reach opposite conclusions. However, as Page et al. (2005) note, these studies focus on only a few years of data and minimum wage effects may be imprecisely estimated in short panels (Baker et al., 1999).[5]

More recently, Page et al. (2005) estimate the effect of state minimum wage increases on welfare caseloads. Using a panel of states and years from 1983 to 1996, the authors find robust evidence that a 10 percent increase in the minimum wage was associated with a 1 to 2 percent increase in welfare caseloads. One explanation for this finding is that minimum wage increases have adverse employment effects for single mothers, thus increasing welfare dependency.

There are two limitations of the above welfare caseload study. First, Page et al. (2005) do not estimate structural models to determine the causal pathways through which

[4] While monopsony power by firms employing low-skilled workers offers one theoretical explanation for the empirical findings of the "new economics of the minimum wage" literature, a 1996 poll found that the median labor economist believes that a 10 percent increase in the minimum wage causes a 1 percent reduction in teenage employment, a finding consistent with Brown, Curtis and Kohen (1982) (Fuchs, Krueger and Poterba, 1998).

[5] While not specifically exploring the effects of minimum wage increases on welfare caseloads, Grogger (2002, 2003) and the Council of Economic Advisors (CEA) use the minimum wage as a control variable in estimating the effects of other policies on welfare caseloads. Grogger finds a statistically insignificant positive effect and CEA finds a significant negative effect. Page et al. (2005) convincingly show that the treatment of state-specific time trends and the time period chosen for analysis can explain differences in their findings from that of the CEA.

minimum wage hikes increase welfare take-up among single mothers. While the most likely pathway is through adverse employment effects, Page et al. (2005) do not provide any empirical evidence on this interpretation of their results. Second, the authors do not examine the effect of minimum wage increases on single mothers in the post-PRWORA period in order to avoid the difficult task of disentangling the effects of welfare reform, economic growth, and minimum wage increases. While this task is empirically challenging, it is arguably the more relevant question in the current policy environment. That is, in the context of pro-work welfare reforms, a growing economy, and expansions in the EITC, do minimum wage increases improve the economic well-being of unmarried mothers?

Three studies by Grogger (2002; 2003; 2004) do not focus on the effect of minimum wage increases on single mothers' employment, but does include the minimum wage as a control variable in estimating the effects of time limits and the EITC on unmarried mothers' labor supply and welfare use from 1979-1999. In welfare use regressions, Grogger finds that higher minimum wages are associated with greater welfare use among those with younger children. The sign on the minimum wage coefficient in employment equations is negative, but is insignificant in most specifications.[6]

This study contributes to the existing minimum wage literature in three important ways. First, no paper in this literature has focused on producing credible estimates of the effect of minimum wage increases on the labor supply, wage income, and poverty status

[6] However, in the minimum wage-employment results reported by Grogger (2003), there are no controls for state-specific time trends. Grogger (2003) does estimate models with state-specific linear and quadratic time trends, but does not report the full results of this estimation. He concludes that the exclusion of state-specific trends does not affect the time limit results, which are the primary focus of his paper.

of unmarried mothers aged 15-55, a vulnerable population targeted by current state and federal policymakers for minimum wage protection. It is also the first to examine the effect of minimum wage increases not only in the immediate post-PRWORA era, which saw a large increase in employment rates among single mothers, but also in the early 2000s, which saw an economic recession and a large increase in the frequency and magnitude of minimum wage increases.[7] Moreover, in addition to examining a nationally representative sample of unmarried single mothers, this study is the first in the literature to focuses on the population of single mothers aged 15-55 who have not received a high school diploma. This low-educated subset of a low-skilled population is even more likely to be affected by changes in minimum wage law.

Second, in contrast to many previous minimum wage analyses, this study follows Couch and Wittenburg (2001) and Sabia (2006) by examining the effect of minimum wage increases on annual hours worked and wage income among working single mothers. These outcomes are important to measure in order to obtain a more complete picture of the effect of minimum wage hikes on the economic well-being of the family (income) as well as other dimensions of the employment contract (work hours). For example, among those who continue working after a minimum wage hike, a minimum wage increase could increase wages and hence annual wage income. However, annual wage income may fall if employers respond to minimum wage increases by cutting back employees' hours.

[7] Since the last federal minimum wage increase (1997), not only are a greater number of states implementing minimum wages higher than the federal minimum (10 states in 1995 vs. 14 states in 2005), but the states that are implementing higher minimum wages are choosing minimum wage levels that are increasingly higher than the federal minimum. The mean state minimum wage among states with minimum wages higher than the federal minimum was 13 percent higher that the federal minimum in 1995 and 28 percent higher than the federal minimum in 2005.

Finally, building on the simulations of Burkhauser et al. (1996a), Burkhauser and Finegan (1989), Burkhauser and Harrison (1999), and Burkhauser and Sabia (2004; 2005; Neumark and Wascher, 2001), this study estimates the effect of minimum wage increases on poverty rates of employed single mothers and compares the effects of minimum wage increases to expansions in the Earned Income Tax Credit (EITC). Given that some policymakers have presented minimum wage hikes as an important antipoverty measure for single mother-headed households, testing the effectiveness of the minimum wage hike in ameliorating poverty relative to the EITC is important.

The study's main results are summarized as follows. Using data on a pooled cross-section of unmarried mothers from the March 1990 to March 2005 Current Population Survey (CPS), fixed effects estimates reveal robust evidence that a growing economy, pro-work welfare reforms, and expansions in the EITC increased the labor supply of unmarried mothers. However, the results also suggest that minimum wage hikes may have undermined the goals of welfare reform and EITC expansions. A 10 percent increase in the minimum wage is associated with a 2.4 to 3.8 percent reduction in single mothers' employment rates. For single mothers without a high school diploma, the effects are even larger, with elasticities ranging from -0.68 to -1.4. Among single mothers who are employed, a 10 percent increase in the minimum wage is associated with a 2.4 to 3.2 percent reduction in annual work hours and a 3 to 4 percent reduction in real income. Consistent with Page et al. (2005), the evidence shows that minimum wage increases are associated with an increase in the proportion of single mothers receiving public assistance, though this effect is imprecisely estimated. And while a 10 percent increase in the maximum EITC grant is associated with a 7 to 8 percent reduction in

poverty rates among full-time employed single mothers, minimum wage increases have no significant effect on poverty rates, with a positive sign on the estimated minimum wage parameter in several specifications. Taken together, the evidence in this study suggests that minimum wage increases undermined the pro-work policy objectives of welfare reform and EITC expansions.

Econometric Model and Data

Following much of the existing minimum wage literature, and building on the model estimated by Page et al. (2005), the econometric model used to estimate the effect of minimum wage increases on single mothers' employment is given as:

$$E_{ist} = \beta MW_{st} + X_{st}\delta + Z_i\gamma + \sum_{s=1}^{S}\alpha_s + \sum_{t=1}^{T}\tau_t + \sum_{s=1}^{S}\omega_s t + \sum_{s=1}^{S}\omega_s t^2 + \varepsilon_{ist} \qquad (1)$$

where E_{ist} is a measure of the employment of person *i* in state *s* at time *t*, MW_{st} is the natural log of the higher of the state or federal minimum wage in time period *t*, X_{st} is a set of state and year-specific economic controls, Z_i are a set of individual characteristics, α_s are time-invariant state effects, τ_t are state-invariant year effects, $\omega_s t$ is a state-specific linear time trend, and $\omega_s t^2$ is a state-specific squared time trend. All models are estimated via weighted least squares with robust standard errors clustered at the state level. Card et al. (1994), and Krueger (1995) have shown that weighting may have an important impact on employment probabilities and is appropriate if one wishes to estimate the extent to which minimum wage increases will affect overall U.S. employment probabilities (Page et al., 2005).[8]

[8] This model is used to estimate the effect of minimum wage increases on several other outcomes: annual hours worked, wage income, welfare receipt, and poverty.

As in Page et al. (2005), identification of minimum wage effects come from variation in minimum wages around a state-specific trend. While the specification in (1) controls for several forms of unmeasured heterogeneity, this comes at a cost of reduced precision. For example, year effects eliminate a potentially important identification source: federal variation in the minimum wage. Moreover, state-specific time trends require estimated employment effects to come off of deviation from trend, which may eliminate some of the state-specific variation in minimum wages. As noted in Page et al. (2005), since the real value of the minimum wage tends to trend downward over time and increase abruptly with the passage of a minimum wage hike, this identification source appears to be appropriate. Moreover, there is a credible theoretical reason to imagine that states adopting higher minimum wages may be trending differently than states that do not adopt higher wages. Minimum wage hikes are likely to be more politically palatable, and are likely to face fewer objections from state legislators, when employment trends are more favorable. When the labor market is tight and a recession is on the horizon, states may be less willing to enact policies such as minimum wage hikes that could exacerbate unemployment. Thus, for both empirical and theoretical reasons, the inclusion of state-specific trends is appropriate.

Equation (1) is estimated using pooled cross-sections from the 1990 to 2005 March CPS. Because questions about poverty, annual work hours, and welfare receipt are asked about the previous year, these data correspond to the years 1989-2004. While the unit of observation is the individual, the estimate of β can be interpreted as the estimated effect of a state minimum wage increase on predicted employment rates. The chief advantage of using individual-level data is the ability to control for individual-

specific characteristics that affect employment decisions, as well as the ability to examine sub-populations, such as less educated single mothers who may be affected by minimum wage increases. An important limitation of these data is that the use of pooled cross-sections may introduce measurement error, as discussed by Page et al. (2005). If there are insufficient state and year-specific observations on single mothers and measurement, particularly from smaller states, and the measurement error is random, then the estimate of β will be unbiased, but inefficient. This is because states with smaller numbers of single mothers sampled are likely to have greater within-state variation in employment rates over time. Moreover, while not expected, if measurement error is systematically correlated with state changes in minimum wage law and with single mothers' employment, then the estimate of β will be biased, though the direction of the bias is a prior uncertain. To address this concern, separate models are estimated on a sub-sample restricted to "large" states. While the results from these alternative models may not be generalizable nationally, they will provide some insight on the consequences of measurement error.

The weighted means and standard deviations of the key dependent and independent variables are found in Table 1. To be included in full sample, an individual must be a single female head of household aged 15-55 with children under 18 living in the family.

Employment Measures. Employment is defined using information about the number of weeks worked last year and the typical number of hours per week. 78 percent of single mothers reported at least one hour of work in the previous year. A single mother is defined as being *steadily employed* if she reports working at least 1,040 hours

last year, which corresponds to an average of 20 hours per week throughout the year. 64 percent of all single mothers in the sample reported working steadily; only 38 percent of unmarried mothers without a high school diploma were employed steadily.[9] *Full-time* employment is defined as working at least 1,820 hours last year, which corresponds to an average of 35 hours per week throughout the year. 50 percent of all single mothers and 26 percent of single mothers with less than a high school education reported working full-time last year.

Figures 1A and 1B show employment trends for the period 1989-2004. Trends for any work (positive work hours last year), steady work, and full-time work show that employment rates for single mothers were steady or slightly declining from 1989-1993, then grew dramatically from 1993 to 2000, and then began falling slightly from 2001-2004. Figure 1B shows that employment rates for less educated single mothers are much lower than for all mothers; the trends over time, however, are quite similar. Employment trends are consistent with (i) a growing economy attracting single mothers into the labor force, (ii) pro-work welfare reforms of the 1996 Personal Responsibility and Work Opportunity Act (PRWORA), and (iii) expansions in the EITC (1990, 1993, 1996) making market work more attractive.

Welfare Receipt and Poverty. A single mother is defined as receiving welfare if she reports receiving some income from public assistance in the previous year. 22 percent of all single mothers and 41 percent of single mothers with less than a high school education reported receiving public assistance benefits during the 1989-2004

[9] As discussed in the results section below, the empirical findings are not sensitive to the parameters of the "steady employment" definition.

period. Figure 2 shows the dramatic decline in welfare receipt over time, with the decline beginning prior to PRWORA, but accelerating following its passage.

36 percent of all single mothers and 64 percent of single mothers with less than a high school education reported living in poverty, where poverty is defined as a household's income-to-needs ratio (INR) falling below 1.[10] Figure 3 presents trends in poverty rates during the 1989-2004 period. The overall poverty rate declined by nearly 35 percent between 1993 and 2000, but leveled off or rose slightly following the recession of 2001. Descriptively, this decline in poverty appears to be largely explained by the large increase in labor force participation during this period. Among single mothers who worked steadily or full-time, poverty rates declined much more modestly during the economic boom of the late 1990s.

State Economic and Policy Variables. State economic and policy variables are expected to influence single mothers' employment outcomes. The minimum wage is measured as the natural log of the larger of the state or federal minimum wage.[11] As in Burkhauser et al. (2000a), Card and Krueger (1995), and Deere et al., (1995), several state and year-specific measures of economic health are included as controls. These measures include the natural log of the average wage rate for workers aged 25-54. Higher market wages are expected to attract workers into the labor force. The unemployment rate for prime age males aged 25-54 is included to capture the availability of jobs. And finally, the natural log of the state Gross Domestic Product (GDP) is included to capture state-specific economic growth.

[10] The income-to-needs ratio is defined as the ratio of household income to the household-size adjusted federal poverty line.

[11] The table in the appendix shows nominal state and federal minimum wages from 1989-2004. For years in which the federal minimum wage changed during the middle of a year, a weighted average of the federal minimum wage level during that year is coded.

During the period from 1989-2004, many state-specific welfare reforms were adopted, as states applied to the federal government for waivers from federal welfare regulations. Between January 1987 and August 1996, 46 states — including the District of Columbia — received approval to implement at least one demonstration project to amend their Aid to Families with Dependent Children (AFDC) and Job Opportunities and Basic Skills (JOBS) programs.[12] Of the states that received approval, 39 actually implemented the waivers before PRWORA was passed in August 1996.[13] This act instituted, at the federal level, many of the welfare waivers with which states had been experimenting and it also facilitated states adopting different types of provisions. The inclusion of year effects in equation (1) will capture federal implementation of welfare reform; thus, welfare reform effects will be identified from variation in state-specific implementation of welfare waivers around a trend. These welfare waivers may affect labor supply decisions of single mothers, particularly poor single mothers who had been, are, or anticipate joining the welfare rolls.

Data on welfare waivers are obtained from the Council of Economic Advisors (1999) and Horvath-Rose and Peters (2001), the latter who interviewed officials from many states in order to collect accurate data about the statewide scope of implementation. As in Horvath-Rose and Peters (2000), this analysis also includes welfare waivers that were not adopted statewide, with the relevant welfare waivers coded to the share of the population covered. Moreover, if a reform was only adopted for some fraction of the year, that fraction is coded in the relevant state and year.

[12] States that either did not apply for approval or did not receive approval on their application were: Alaska, Kentucky, Nevada, New Mexico and Rhode Island.
[13] States that did not implement the waivers prior to August, 1996 were: D.C., Idaho, Kansas, Louisiana, Maine, South Carolina, and Tennessee. These states then either implemented them under the new Temporary Assistance to Needy Families (TANF) laws or rewrote them.

Four welfare reform policies are included in the analysis: work requirements, time limits for welfare benefits, family caps, and sanctions for non-compliance with child support arrangements. Among the four policies, work requirements provide an unambiguous incentive to increase labor supply. Time limits also reduce long-run welfare benefits and may induce single mothers on welfare to increase labor supply. The family cap and child support enforcement policies are expected to affect labor supply indirectly. Family caps reduce or eliminate the incremental AFDC/TANF benefits if a single mother on welfare has an additional child while on the welfare rolls. This policy provides a disincentive for additional out of wedlock childbearing and a potential incentive to increase labor supply in the presence of additional new children since additional benefits will not be forthcoming. Sanctions for non-compliance with child support arrangements provide incentives for welfare mothers to establish paternity and to induce fathers to pay child support. The effect of this policy on labor supply is ambiguous — if it encourages mothers to obtain child support, it may decrease incentives for work; however if mothers do not want contact with the father, failing to assist the state in establishing paternity would result in a welfare benefit cut, creating incentives to increase labor supply.

In addition to welfare waivers, the natural log of the state and year-specific maximum AFDC-food stamp benefit for a family of three is included as a control variable. This benefit level captures the attractiveness of unemployment. Declines in a state's real AFDC-food stamp benefit are expected to increase labor supply (Moffitt, 1992).

Finally, a measure of the maximum state and family-size specific EITC credit allowable is included. Many studies in the literature have found that expansions in the EITC are associated with an increase in labor supply, though this effect is concentrated along the extensive margin (see, for example, Hotz and Scholz, 2003; Eissa and Hoynes, 2005; Meyer, 2002; Meyer and Rosenbaum, 2001; Ellwood, 2000; Grogger, 2003; Meyer and Jenn, 2000; Hotz et al., 2001; Eissa and Liebman, 1996). That is, work participation decisions are affected by the EITC, but work hours are not especially sensitive to changes in the EITC. While there were large expansions in the EITC subsidy rate and maximum credit in 1990, 1993, and 1996, these policy changes will be largely captured by year effects in equation (1). However, during the period 1989-2004, 11 states enacted or changed their refundable EITC credit, thus increasing the maximum credit available to workers. New York, Minnesota, and Vermont each offered refundable credits of at least 30 percent of the federal EITC, which would increase the maximum credit by nearly $1,200 for a family with two or more children.[14] Because the EITC may have an important affect on labor supply decisions for single mothers, a variable measuring the natural log of the higher of the state or federal maximum EITC benefit is included.

Individual Level Characteristics. Included in Z are the standard set of demographic characteristics that are expected to affect labor supply. These include age, age squared, race, education (measured by whether the woman has less then a high school degree, a high school degree, some college, a college degree, or some post college training), whether the mother has a disability that limits work, young children under 6 in

[14] The maximum federal EITC credit in 2004 was 4,300. In Wisconsin, a refundable credit of 43% of the federal EITC is available for a family with three or more children, which would result in a possible maximum credit of $6,149.

the household, the number of children in the house, and whether the mother lives in a metropolitan statistical area (MSA).

There are 76,034 single mothers in the sample with non-missing observations and 16,370 single mothers who have not completed high school. All variables that measure dollar amounts (minimum wages, EITC benefits, AFDC-FS benefits, annual income, state GDP, and state mean wage) are adjusted for inflation and are measured in 2004 dollars.

Results

Employment Effects. Table 2 presents estimates of the effect of minimum wage increases on the employment of single mothers during the period 1989-2004. Given the functional form of the specification, elasticities are calculated via the product of the coefficient on the log minimum wage variable and the mean of the dependent variable (reported in Table 1). Each model includes state effects, year effects, and state-specific time trends. Identification comes from variation in the minimum wage around these state-specific trends.

The dependent variable in models (1)-(3) is whether the single mother was steadily employed for, and the dependent variable in models (4)-(6) is whether she was employed full-time.[15] Model (1) regresses steady employment on the minimum wage and individual characteristics; model (2) includes state-specific indicators of economic

[15] The results presented are not sensitive to the definition of steady employment. For example, a more liberal definition defining steady work as working at least 15 hours per week for at least 35 weeks produces similar results. Later, we consider an indicator for whether a single mother worked *any hours* in the previous year, though small numbers of hours worked in a year could introduce additional measurement error as it is likely to be correlated with informal labor market work not directly affected by minimum wage, welfare, or EITC policies.

health; and model (3) includes the set of state-specific welfare reform policies, state EITC expansions, and state welfare benefits packages. Estimates from each of these models show that an increase in the minimum wage is associated with lower steady employment among single mothers. A 10 percent increase in the minimum wage is associated with a 2.4 to 2.8 percent reduction in single mothers' estimated employment rate.

The findings in Model (3) suggest that while the implementation of pro-work welfare reforms, a growing economy, and expansions in the EITC were increasing the labor supply of single mothers, minimum wage increases reduced steady employment opportunities for them. This result suggests that rather than attract single mothers into the labor market with higher wages, demand-side effects of minimum wage hikes dominated, with increases in the minimum wage undermining the pro-work goals of welfare reform and the EITC.

Individual-level characteristics were the most important determinants of labor supply, as expected. Less educated single mothers, those with disabilities that limited work, those with younger children, those with greater numbers of children, younger single mothers, and Blacks (relative to whites) were each less likely to be steadily employed than their respective counterparts. Year effects and state-specific time trends were highly significant, likely reflecting that economic growth and PRWORA were among the most important factors influencing labor supply outcomes for single mothers during this period.

Models (4)-(6) reflect that the results for steady employment held for full-time employment as well, with minimum wage elasticities that were slightly higher. A 10 percent increase in the minimum wage is associated with a 3.0 to 3.7 percent lower full-

time employment rate for single mothers. This may reflect that minimum wage increases affect labor supply on the intensive margin as well, a possibility explored in a later table. This result is robust to the inclusion or exclusion of state-specific observable macroeconomic controls, state welfare reform policies, and state EITC expansions. Note that in contrast to the findings for steady employment, EITC effects and welfare reform effects are no longer significant, which may reflect that their influence dominates in the work participation decision, which is captured more cleanly in the steady employment regressions. Taken together, the results in Table 2 suggest consistent evidence that minimum wage hikes have not attracted single mothers into the labor force, but rather have diminished employment opportunities.

While the full sample of single mothers represents a vulnerable population that policymakers have sought to target for minimum wage protection, the heterogeneity in skill-level among these workers suggests that the estimated effects in Table 2 could be lower bound estimates of the effects of minimum wage hikes on the least skilled single mothers.

In Table 3, a subset of the least skilled single mothers is examined: single mothers who have attained less than a high school education. As in Table (2), the first three models present results for steady employment and the final three models present results for full-time employment. The results suggest consistent evidence that minimum wage increases adversely affect employment opportunities for single mothers with less than a high school education. Estimated elasticities are larger for less educated mothers than was the case in the full sample. A 10 percent increase in the minimum wage is associated with a 6.8 to 8.1 percent decline in steady employment rates and a 12 to 14 percent

decline in full-time employment rates. These estimated elasticities are similar in magnitude to what Burkhauser et al. (1996) found for less educated young African Americans. The results again suggest that minimum wage policy has its strongest adverse employment effects on the least skilled, most vulnerable workers.

The results in Tables 2 and 3 have utilized the full sample of single mothers. However, as Page et al. (2005) note, there may be important measurement error introduced by smaller states due to large within-state variation in employment rates. While this measurement error is not expected to be systematically correlated with minimum wage increases, if the unmeasured error is positively correlated with minimum wage increases and negatively correlated with employment, then this measurement error could be driving the previous results. More probable, however, is that the measurement error is simply creating random noise in the dependent variable, which is resulting in unbiased, but inefficient estimates of the effect of minimum wage hikes.

In Table 4, the sample of all single mothers is restricted to (i) the 30 states that have at least 50 single mothers sampled in each state and in each year[16], and (ii) the 11 states that have at least 150 single mothers sampled in each state and in each year.[17] Across specifications for both the sample of all single mothers and for less educated single mothers, there remains consistent evidence that minimum wage increases are associated with significantly lower employment rates. In fact, for the sample of all single mothers, almost all are now significant at the 1 percent level, suggesting that these estimates may be more precise. The elasticities for steady employment range from -0.35 for all single mothers to -0.81 for less educated single mothers; for full-time employment,

[16] These states include AK, AL, AR, CA, DC, DE, FL, GA, IL, KS, KY, LA, MA, MI, MO, MS, NC, NJ, NM, NY, OH, OK, PA, RI, SC, SD, TN, TX, WI, and WV.
[17] These states include CA, FL, IL, MA, MI, NC, NJ, NY, OH, PA, and TX.

elasticities range from -0.45 for all single mothers to -1.2 for less educated single mothers. These results reflect that the significant adverse effects of minimum wage increases are not driven by systematic measurement error.

Additional robustness checks on the estimates in Tables 2 and 3 are presented in Table 5. The previous models have assumed a linear-log relationship between the minimum wage and employment. In models (1)-(4) of Table 5, we explore whether the significant effects are driven by this nonlinearity assumption. In these models, the effect of real minimum wage *levels* on employment is estimated. Estimated elasticities are calculated as the product of the estimated parameter and the ratio of the mean of the minimum wage and the employment rate. The findings in the level models are consistent with those in Tables 2-4. A 10 percent increase in the minimum wage is associated with a 2.3 to 2.5 percent reduction in employment of all single mothers and a 10 percent reduction in employment of less educated mothers.

Next, models (5)-(8) examine whether the results are sensitive to the definition of steady employment. Models (5) and (6) define steady employment as working 15 hours per week for at least 35 weeks last year. The results are similar for both all single mothers and less educated single mothers. With this definition, a 10 percent increase in the minimum wage is associated with a 2.7 percent reduction in employment for all single mothers and an 8.5 percent reduction in employment for less educated single mothers. When employment is defined as any positive work hours last year (models 7 and 8), the results become smaller in magnitude and are insignificant for the full sample, but remain significant for the less educated sample. One explanation for this result is that

a worker working a very small number of annual work hours may be engaged in informal employment that is not covered by minimum wage policy.

Finally, as Neumark et al. (2004), Burkhauser et al. (2000a), and Page et al. (2005) suggest, there may be important lagged minimum wage effects. Hence, the specification in model (9) includes both contemporaneous and lagged minimum wages. The signs on each of the coefficients is negative, but neither is individually significant; however, the implied long-run elasticity is consistent with previous estimates (-0.28). In model (9), it is interesting to note that the magnitude of the estimated parameter on the lagged minimum wage is larger than the coefficient on the contemporaneous minimum wage variable. Thus in model (10), only the lagged minimum wage is included. Again, the implied elasticity is -0.27, which is consistent with previous findings.

To this point, this study has focused exclusively on employment effects, as is the case in much of the minimum wage literature. However, this is not the only outcome that may be affected by minimum wage increases. Minimum wage hikes may impact other dimensions of the employment contract (hours worked), may affect reliance on public assistance programs (welfare), and may impact household-specific economic well-being (poverty). These outcomes are explored in the remaining tables.

Hours, Income, and Welfare Receipt. Findings by Couch and Wittenburg (2001), and Sabia (2006) suggest that minimum wage increases may not just affect employment rates, but may also affect hours worked. Employers may respond to minimum wage increases not only by laying off workers, but also by reducing hours worked among their employees. In models (1) and (2) of Table 6, the effect of minimum wage increases on annual hours worked among single mothers reporting positive hours of employment is

estimated. There is some evidence that minimum wage increases are associated with fewer hours worked, with estimated hours elasticities between -0.24 and -0.32. The coefficient is only significant when the sample is restricted to "larger" states reflecting that measurement error may result in imprecisely estimated hours elasticities in the full sample. The result in model (2) is consistent with empirical findings on teenagers (Couch and Wittenberg, 2001; Sabia, 2006), and suggests that minimum wage increases may affect other dimensions of the employment contract than simply employment. In this sense, adverse employment effects may be lower bound estimates of the effects of minimum wage increases.[18]

Models (3)-(5) examine whether minimum wage increases have a significant effect on the annual wage income of employed single mothers. Models (3) and (4), which restrict the sample to those working positive work hours, suggest little evidence that minimum wage effects increase wage income, and, in fact, some evidence that increases in the minimum wage may decrease household income. A 10 percent increase in the minimum wage is associated with a 3 to 4 percent decrease in annual income. However, this result is not robust when restricting the sample to those working steadily (model 5). In this sample, minimum wage increases have no significant effect on single mothers' wage income. This result suggests that among workers, the demand-side reduction in work hours by employers neutralizes, or perhaps dominates, any positive wage gains. In sharp contrast to the negative minimum wage effects, note that pro-work

[18] Estimates of the effect of minimum wage increases on hours worked among working single mothers with less than a high school education reflect a negative relationship between minimum wage increases and hours worked. However, these estimates are not presented due to imprecision caused by small state and year-specific sample sizes.

welfare requirements, and expansions in state EITC programs consistently have positive effects on labor supply and annual wage income.

The results in Tables 2-5 and the first five columns of Table 6 provide empirical support for a labor supply-related interpretation of the minimum wage-welfare study by Page et al. (2005). Because minimum wage increases have negative effects on employment and hours worked, and do not have a significant positive effect on wage income, they may have the unintended consequence of increasing welfare caseloads. This hypothesis is tested directly in these data. In models (6)-(8) of Table 6, the effects of minimum wage increases on welfare receipt is estimated. In the full sample of single mothers (model 6), the coefficient on the minimum wage variable is positive, but is not statistically significant. This is consistent with the finding reported in footnote 9 of Page et al. (2005). Those authors interpreted the absence of statistical significance as evidence that measurement error in the dependent variable—predicted welfare receipt probabilities—led to inflated standard errors. In models (7) and (8), the sample is restricted to the largest states to test this hypothesis. Here, there is some evidence that an increase in the minimum wage is associated with a significant increase in welfare receipt. A 10 percent increase in the minimum wage is associated with an approximately 8 percent increase in welfare receipt. However, one should exercise care in generalizing these estimated elasticities nationally given the restrictions placed on the sample.

Poverty. A number of studies (Neumark et al. (2004, Neumark and Wascher, 2001; Burkhauser et al., 1996a; Burkhauser and Finegan, 1989; Burkhauser and Harrison; 1999; Burkhauser and Sabia, 2004; 2005) have examined the effectiveness of minimum wage policy as an antipoverty tool among the working poor. Neumark et al. (2002; 2004)

have examined household-specific flows into and out of poverty and how these flows are related to minimum wage policy. Their results reflect that minimum wage increases may increase poverty among some low-wage workers. Burkhauser and colleagues have focused attention on the target inefficiency of minimum wage increases, because most minimum wage workers are not poor and workers from poor families earn wage rates greater than federal minimum wage levels. In simulations that assume no adverse employment effects Burkhauser et al. 1996 have found that the EITC is a more target efficient antipoverty policy. To this point, however, no studies have compared the effects of minimum wage increases on the poverty rates of working single mothers to the effects of EITC expansions on poverty rates. In Table 7, this issue is explored.

All models include the full set of control variables as in the previous tables.[19] In these models, the sample is restricted to working single mothers, which gives the minimum wage is given its best chance to improve economic conditions of families. If the minimum wage increases poverty by causing employed single moms to lose their jobs, then the estimates in Table 7 can be interpreted as lower bound estimates. The three measures of poverty examined are *severe poverty* (whether household income falls below 75 percent of the household-size adjusted federal poverty line), *poverty* (below 100 percent of the poverty line), and *near-poverty* (below 125 percent of the poverty line). Separate models are estimated for the full sample and for the large state sample.[20]

Across samples and definitions of poverty, there is no evidence that minimum wage increases reduce poverty. In fact, in most specifications, the coefficient is positive

[19] Estimated coefficients on the remaining independent variables are available upon request.
[20] While one would like to estimate models of the effect of minimum wage increases on poverty of working single mothers with less than a high school education, these results are not presented because the sample size is too small to credible identify minimum wage effects, even if the sample were restricted to "large" states.

and insignificant. In contrast, the maximum EITC credit is associated with a significant reduction in the likelihood that a single mother headed household lives in poverty. The estimated coefficient on the EITC variable is larger among full-time workers than among merely steady employed workers, suggesting that those who work more hours receive a higher credit. A 10 percent increase in the minimum wage is associated with a 3 to 4 percent reduction in poverty rates among steadily employed workers and a 7 to 8 percent reduction in poverty rates among those working full time. At 125 percent of the poverty line, the effects of the EITC on poverty are insignificant. The results in Table 7 suggest that, relative to the EITC, raising the minimum wage is an ineffective antipoverty tool for working single female headed households. This result can be explained by two important facts. First, the EITC program targets poor families while the minimum wage may not. Second, steady employment is the most effective antipoverty tool, and while employment is encouraged by the EITC, low-skilled labor demand is reduced by increases in the minimum wage.

Taken together, the results in Tables 2-7 suggest that policymakers' claims that minimum wage increases are an important economic aid to single mothers, the evidence suggests that such increases decrease the likelihood of steady employment, reduce hours worked, and have no effect on poverty rates. In contrast, state expansions in the EITC during the 1990s and 2000s appear to have enhanced the economic well-being of single female-headed households.

Conclusions

The 1990s and early 2000s were a period that saw important economic change for single mothers. Employment rates rose, welfare receipt fell, and poverty rates fell. The evidence presented here suggests that while pro-work welfare reforms, a growing economy, and expansions in the Earned Income Tax Credit program each played a role in these positive economic trends, increases in the minimum wage did not. Rather, the evidence in this study finds that minimum wage increases reduced single mothers' labor force participation and hours worked, and may have enhanced welfare dependency while failing to alleviate poverty. A 10 percent increase in the minimum wage is associated with a 2.4 to 3.8 percent reduction in single mothers' employment. Among less educated single mothers, the effects are even larger, with elasticities around unity in some specifications. Among single mothers who are employed, a 10 percent increase in the minimum wage is associated with a 2.4 to 3.2 percent reduction in annual hours worked and a 3 to 4 percent reduction in real income. Minimum wage increases have no significant effect on poverty with the sign on the relevant being positive in several specifications.

The results of this study should serve as a caution to policymakers who view minimum wage increases as an effective policy tool to help single mothers to avoid poverty, the welfare rolls, and unemployment. Rather, the evidence presented here reflects that minimum wage hikes actually undermined the goals of pro-work welfare reforms and pro-work EITC expansions, as well as the rising tide of a growing economy. While the results presented here do not preclude possible minimum wage gains for some single female headed households, on net, employment is depressed and poverty is not alleviated. Because an increase in labor supply appears to be the chief reason for the

improved economic well-being of single mother families, it is not surprising that minimum wage increases have created an unintended glass ceiling for this vulnerable population.

Finally, it is important to note that the adverse employment effects reported in this study may well be lower bound estimates of the overall adverse effects of minimum wage increases. The labor contract is, in principle, multifaceted, and minimum wage increases could have important effects on job flexibility, on-the-job training, fringe benefits, turnover, and the part-time and full-time composition of the labor force. These and other dimensions of the employment contract could be adversely affected by minimum wage hikes in both the short and long-run. These issues remain largely unexplored in the literature, often because of the lack of credible data. However, these important areas should be investigated in future work on single mothers.

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Figure 1A: Labor Force Participation of Single Mothers, 1989-2004

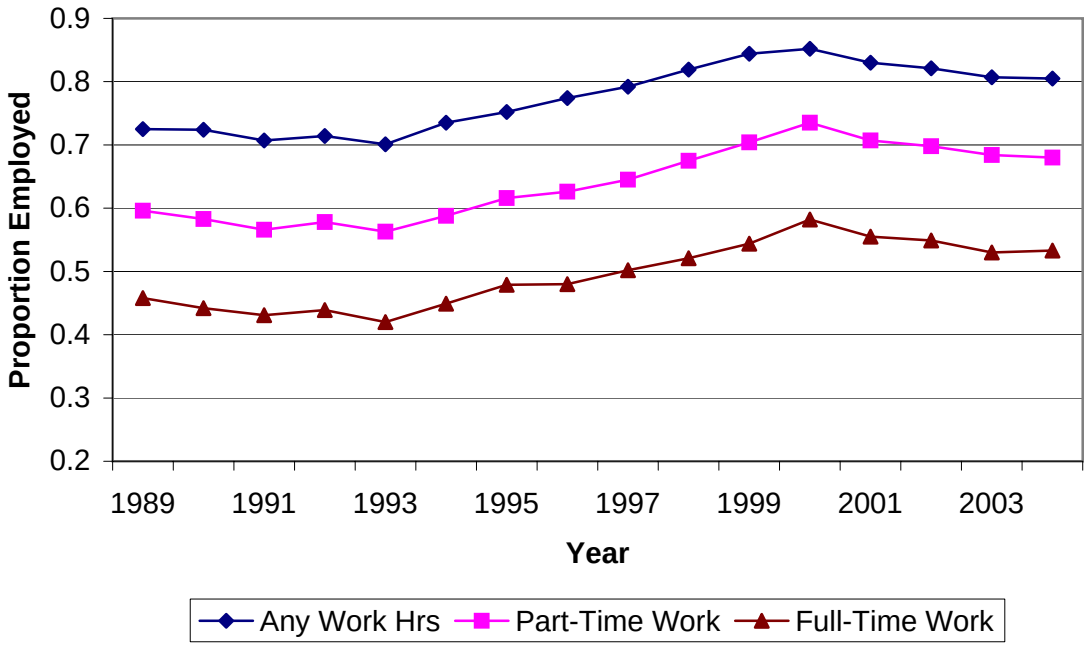

Figure 1B: Labor Force Participation of Single Mothers with Less than HS Education, 1989-2004

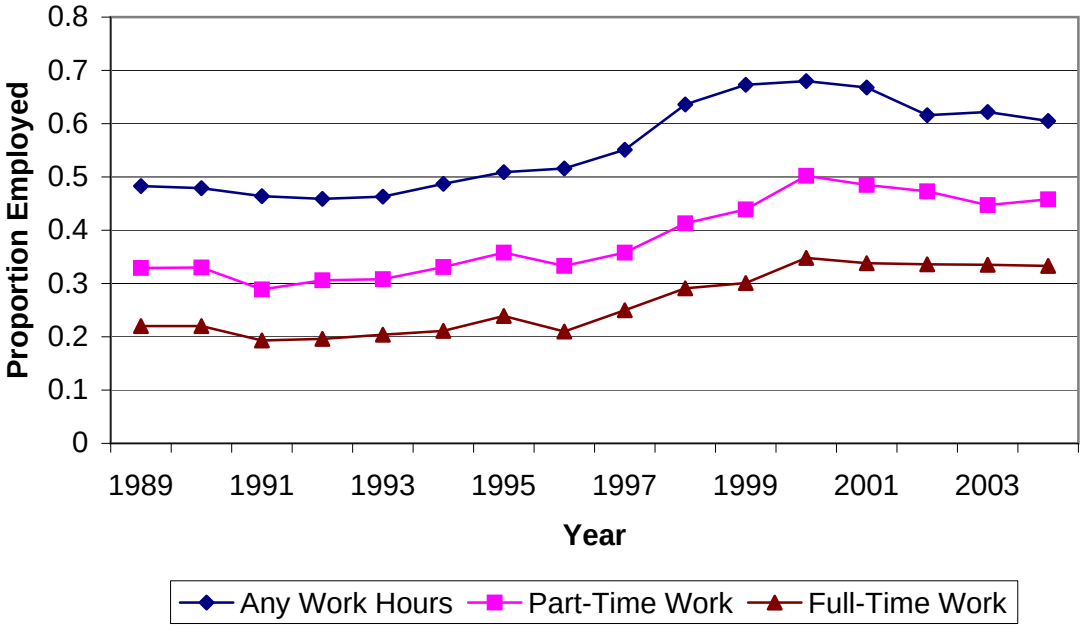

Figure 2: Welfare Receipt by Single Mothers, 1989-2004

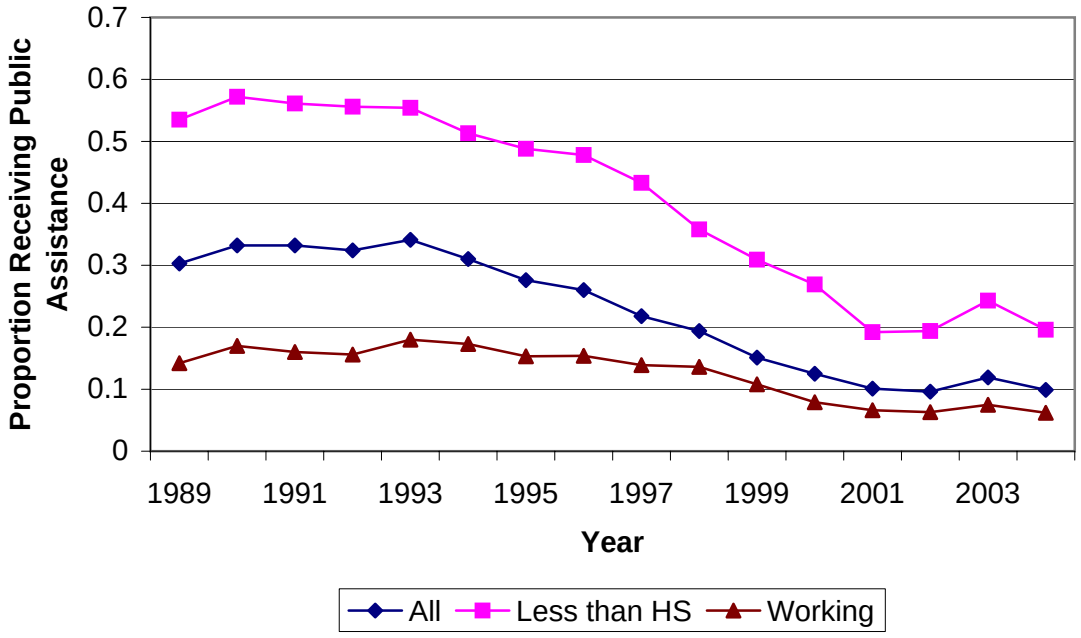

Figure 3: Poverty Rates of Single Mothers, 1989-2004

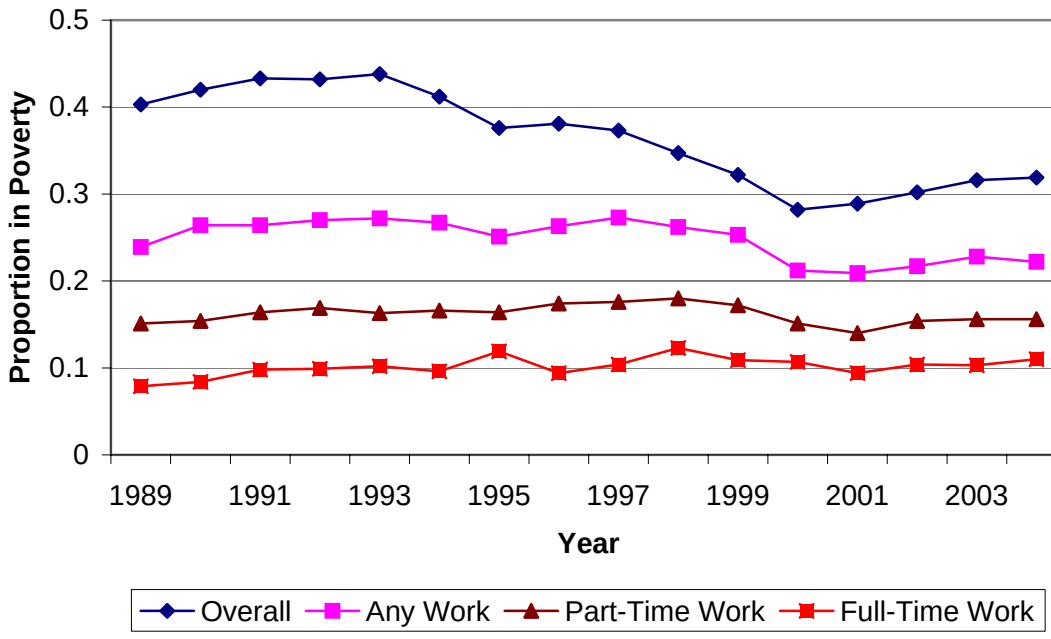

Table 1: Weighted Means and Standard Deviations of Variables

	Full Sample		Large (30) State Sample[1]		Steady Work Sample	Full-Time Work Sample
	All (1)	< HS (2)	All (3)	< HS (4)	All (5)	All (6)
Steady Employment (≥ 1,040 Hours)	0.642 (0.480)	0.380 (0.486)	0.630 (0.483)	0.373 (0.484)	---	---
Full-Time Employment (≥ 1,820 Hours)	0.496 (0.500)	0.260 (0.439)	0.487 (0.500)	0.255 (0.436)	0.774 (0.418)	---
Any Work Hours	0.777 (0.416)	0.552 (0.497)	0.764 (0.424)	0.542 (0.498)	---	---
Ln (Work Hours)	---	---	---	---	7.57 (0.232)	7.67 (0.127)
Ln (Annual Income)	---	---	---	---	9.64 (0.769)	9.380 (0.627)
< 75% Poverty Line	0.276 (0.477)	0.517 (0.500)	0.291 (0.454)	0.529 (0.499)	0.087 (0.282)	0.047 (0.211)
< 100% Poverty Line	0.363 (0.481)	0.637 (0.481)	0.380 (0.485)	0.648 (0.478)	0.162 (0.368)	0.103 (0.303)
< 125% Poverty Line	0.443 (0.497)	0.728 (0.445)	0.461 (0.498)	0.738 (0.440)	0.246 (0.431)	0.177 (0.382)
Welfare Receipt	0.220 (0.414)	0.412 (0.492)	0.225 (0.417)	0.415 (0.493)	0.061 (0.238)	0.030 (0.172)
Ln (Minimum Wage)	1.37 (0.261)	1.34 (0.268)	1.36 (0.259)	1.34 (0.265)	1.39 (0.259)	1.39 (0.258)
Ln (Max EITC Benefit)	7.57 (0.604)	7.54 (0.643)	7.57 (0.605)	7.55 (0.643)	7.60 (0.588)	7.60 (0.584)
Work Requirement	0.588 (0.477)	0.542 (0.483)	0.588 (0.476)	0.549 (0.482)	0.625 (0.470)	0.630 (0.468)
Time Limit	0.538 (0.495)	0.485 (0.497)	0.531 (0.495)	0.479 (0.496)	0.578 (0.490)	0.584 (0.489)
Family Cap	0.317 (0.460)	0.303 (0.454)	0.321 (0.462)	0.304 (0.454)	0.338 (0.468)	0.345 (0.470)
Paternity Enforcement	0.533 (0.496)	0.482 (0.497)	0.529 (0.496)	0.478 (0.497)	0.572 (0.492)	0.579 (0.491)
Ln (Max AFDC-FS3 Benefit)	6.32 (0.253)	6.31 (0.267)	6.31 (0.264)	6.30 (0.276)	6.32 (0.251)	6.32 (0.250)
Less than HS Educ	0.214 (0.410)	---	0.227 (0.419)	---	0.127 (0.333)	0.112 (0.316)
Some College	0.302 (0.459)	---	0.294 (0.456)	---	0.246 (0.431)	0.350 (0.477)

Table 1 Con't

	Full Sample		Large State Sample		Steady Work Sample	Full-Time Work Sample
	All (1)	< HS (2)	All (3)	< HS (4)	All (5)	All (6)
College	0.084	---	0.080	---	0.111	0.120
	(0.277)		(0.272)		(0.314)	(0.325)
Post-College	0.033	---	0.032	---	0.046	0.050
	(0.180)		(0.175)		(0.210)	(0.217)
Disability	0.087	0.142	0.089	0.144	0.025	0.275
	(0.282)	(0.349)	(0.285)	(0.351)	(0.156)	(0.446)
Child < 6 years	0.373	0.436	0.374	0.432	0.302	0.275
	(0.484)	(0.496)	(0.484)	(0.495)	(0.459)	(0.466)
Number of Children	1.84	2.21	1.86	2.23	1.69	1.66
	(1.04)	(1.29)	(1.06)	(1.30)	(0.898)	(0.878)
Age	35.3	33.9	35.3	34.2	36.4	37.0
	(8.73)	(9.81)	(8.75)	(9.79)	(8.17)	(7.92)
Black	0.335	0.366	0.366	0.383	0.308	0.308
	(0.472)	(0.482)	(0.482)	(0.486)	(0.462)	(0.462)
Non-MSA	0.177	0.176	0.163	0.165	0.173	0.168
	(0.382)	(0.381)	(0.370)	(0.371)	(0.379)	(0.374)
State Unemployment Rate (Males Aged 25-54)	0.087	0.089	0.093	0.093	0.087	0.087
	(0.025)	(0.025)	(0.024)	(0.023)	(0.025)	(0.025)
Ln (State Mean Wage) (All Aged 25-54)	3.06	3.03	3.06	3.02	3.09	3.09
	(0.343)	(0.343)	(0.337)	(0.339)	(0.342)	(0.342)
Ln (State GDP)	12.23	12.33	12.43	12.48	12.23	12.24
	(0.999)	(1.00)	(0.953)	(0.964)	(0.997)	(0.995)
N	76,034	16,370	57,692	13,629	48,808	37,690

[1]These states are AK, AL, AR, CA, DC, DE, FL, GA, IL, KS, KY, LA, MA, MI, MO, MS, NC, NJ, NM, NY, OH, OK, PA, RI, SC, SD, TN, TX, WI, and WV.

Table 2: Estimates of Relationship Between Log Minimum Wage and Employment of Single Mothers, 1989-2004

	Steady Employment (≥ 1,040 Hours)			Full-Time Employment (≥ 1,820 Hours)		
	(1)	(2)	(3)	(4)	(5)	(6)
Ln (Minimum Wage)	-0.156**	-0.173***	-0.179**	-0.147**	-0.169**	-0.184***
	(0.067)	(0.066)	(0.070)	(0.071)	(0.067)	(0.068)
Min Wage Elasticity	*-0.243*	*-0.269*	*-0.279*	*-0.296*	*-0.341*	*-0.371*
Ln (Max EITC Benefit)	---	---	0.070***	---	---	0.014
			(0.012)			(0.014)
Work Requirement	---	---	0.060***	---	---	0.039
			(0.016)			(0.026)
Time Limit	---	---	-0.012	---	---	-0.024
			(0.019)			(0.025)
Family Cap	---	---	0.020	---	---	0.034**
			(0.015)			(0.015)
Paternity Enforcement	---	---	0.017	---	---	0.045**
			(0.025)			(0.021)
Ln (Max AFDC-FS3 Benefit)	---	---	-0.173	---	---	-0.165
			(0.166)			(0.146)
Less than HS Educ	-0.185***	-0.185***	-0.184***	-0.159***	-0.159***	-0.159***
	(0.007)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)
Some College	0.047***	0.047***	0.047***	0.044***	0.043***	0.043***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
College	0.103***	0.103***	0.104***	0.114***	0.114***	0.114***
	(0.008)	(0.008)	(0.008)	(0.010)	(0.010)	(0.010)
Post-College	0.125***	0.125***	0.125***	0.119***	0.119***	0.118***
	(0.012)	(0.012)	(0.012)	(0.014)	(0.014)	(0.014)
Disability	-0.488***	-0.489***	-0.489***	-0.429***	-0.429***	-0.429***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Child < 6 years	-0.089***	-0.089***	-0.089***	-0.089***	-0.089***	-0.089***
	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)
Number of Children	-0.059***	-0.059***	-0.068***	-0.055***	-0.055***	-0.057***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Age	0.051***	0.051***	0.050***	0.055***	0.055***	0.055***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Age Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)
Black	-0.036***	-0.036***	-0.036***	-0.023***	-0.023***	-0.023***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Non-MSA	-0.024***	-0.024***	-0.024***	-0.035***	-0.035***	-0.035***
	(0.009)	(0.009)	(0.009)	(0.007)	(0.007)	(0.007)
State Unemployment Rate	---	-0.402**	-0.469**	---	-0.357*	-0.418**
		(0.186)	(0.182)		(0.208)	(0.203)
Ln (State Mean Wage)	---	0.040*	0.042**	---	0.060***	0.065***
		(0.022)	(0.020)		(0.020)	(0.018)
Ln (State GDP)	---	-0.067	-0.002	---	-0.080	-0.011
		(0.106)	(0.107)		(0.094)	(0.094)
State Effects?	Y	Y	Y	Y	Y	Y
Year Effects?	Y	Y	Y	Y	Y	Y
State -Specific Linear and Quadratic Time Trends?	Y	Y	Y	Y	Y	Y
N	76,034	76,034	76,034	76,034	76,034	76,034

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

Robust standard errors are in parentheses. All regressions are estimated via weighted least squares.

[1]Omitted category is high school completion.

[2]Omitted category is Caucasian; Asian, American Indian and Other race categories are also included in all models.

[3]Sample includes single mothers betwene ages 15 and 55.

Table 3: Estimates of Relationship Between Log Minimum Wage and Employment of Single Mothers with Less than High School Education, 1989-2004

	Steady Employment (≥ 1,040 Hours)			Full-Time Employment (≥ 1,820 Hours)		
	(1)	(2)	(3)	(4)	(5)	(6)
Ln (Minimum Wage)	-0.257**	-0.280**	-0.307**	-0.301***	-0.322***	-0.364***
	(0.126)	(0.134)	(0.148)	(0.106)	(0.109)	(0.111)
Min Wage Elasticity	*-0.676*	*-0.737*	*-0.808*	*-1.158*	*-1.238*	*-1.400*
Ln (Max EITC Benefit)	---	---	0.049*	---	---	-0.006
			(0.027)			(0.026)
Work Requirement	---	---	-0.015	---	---	-0.019
			(0.048)			(0.043)
Time Limit	---	---	-0.080	---	---	-0.051
			(0.047)			(0.052)
Family Cap	---	---	0.051	---	---	0.063**
			(0.031)			(0.024)
Paternity Enforcement	---	---	0.027	---	---	0.062
			(0.057)			(0.044)
Ln (Max AFDC-FS3 Benefit)	---	---	0.156	---	---	-0.045
			(0.244)			(0.237)
Disability	-0.412***	-0.412***	-0.411***	-0.312***	-0.312***	-0.311***
	(0.013)	(0.013)	(0.013)	(0.007)	(0.007)	(0.007)
Child < 6 years	-0.103***	-0.102***	-0.102***	-0.093***	-0.093***	-0.092***
	(0.014)	(0.014)	(0.014)	(0.012)	(0.012)	(0.012)
Number of Children	-0.048***	-0.048***	-0.052***	-0.037***	-0.037***	-0.037***
	(0.003)	(0.003)	(0.005)	(0.003)	(0.003)	(0.003)
Age	0.053***	0.053***	0.053***	0.044***	0.044***	0.044***
	(0.005)	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)
Age Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Black	-0.044***	-0.044***	-0.043***	-0.028**	-0.028**	-0.028**
	(0.016)	(0.016)	(0.016)	(0.013)	(0.013)	(0.013)
Non-MSA	-0.036**	-0.036**	-0.036**	-0.023**	-0.023**	-0.023**
	(0.016)	(0.016)	(0.016)	(0.011)	(0.011)	(0.011)
State Unemployment Rate	---	-0.029	-0.042	---	-0.029	-0.090
		(0.346)	(0.338)		(0.346)	(0.393)
Ln (State Mean Wage)	---	0.051	0.060	---	0.051	0.061
		(0.042)	(0.045)		(0.042)	(0.037)
Ln (State GDP)	---	0.298	0.373*	---	0.298	0.301*
		(0.191)	(0.202)		(0.191)	(0.160)
State Effects?	Y	Y	Y	Y	Y	Y
Year Effects?	Y	Y	Y	Y	Y	Y
State -Specific Linear and Quadratic Time Trends?	Y	Y	Y	Y	Y	Y
N	16,370	16,370	16,370	16,370	16,370	16,370

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

Table 4: Estimates of Relationship Between Log Minimum Wage and Employment of Single Mothers in "Large" States, 1989-2004

	Steady Employment (≥ 1,040 Hours)				Full-Time Employment (≥ 1,820 Hours)			
	30 States		11 States[1]		30 States		11 States[1]	
	All	< HS	All	< HS	All	< HS	All	< HS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln (Minimum Wage)	-0.239***	-0.255	-0.217***	-0.300*	-0.218***	-0.346***	-0.186**	-0.299**
	(0.071)	(0.163)	(0.065)	(0.154)	(0.060)	(0.117)	(0.064)	(0.144)
Min Wage Elasticity	*-0.379*	*-0.684*	*-0.349*	*-0.806*	*-0.448*	*-1.357*	*-0.388*	*-1.163*
Ln (Max EITC Benefit)	0.067***	0.025	0.071***	0.038	0.014	-0.027	0.016	-0.022
	(0.014)	(0.029)	(0.016)	(0.035)	(0.016)	(0.028)	(0.019)	(0.034)
Work Requirement	0.060***	-0.009	0.066***	0.021	0.033	-0.026	0.015	-0.005
	(0.019)	(0.055)	(0.019)	(0.053)	(0.028)	(0.028)	(0.015)	(0.040)
Time Limit	0.008	-0.026	0.026	-0.031	-0.003	-0.019	0.013	0.034
	(0.023)	(0.047)	(0.023)	(0.044)	(0.020)	(0.044)	(0.019)	(0.051)
Family Cap	0.019	0.062*	0.002	0.070	0.031*	0.080***	0.020	0.066*
	(0.017)	(0.034)	(0.023)	(0.043)	(0.016)	(0.026)	(0.017)	(0.032)
Paternity Enforcement	0.037	0.021	0.036	0.022	0.050**	0.046	0.041	0.046
	(0.023)	(0.054)	(0.031)	(0.054)	(0.019)	(0.049)	(0.026)	(0.057)
Ln (Max AFDC-FS3 Benefit)	-0.211	0.096	-0.048	0.151	-0.144	0.132	0.037	0.081
	(0.190)	(0.248)	(0.226)	(0.237)	(0.178)	(0.215)	(0.201)	(0.196)
Less than HS Educ	-0.184***	---	-0.182***	---	-0.159***	---	-0.157***	---
	(0.008)		(0.009)		(0.005)		(0.006)	
Some College	0.056***	---	0.056***	---	0.053***	---	0.047***	---
	(0.004)		(0.006)		(0.005)		(0.005)	
College	0.116***	---	0.115***	---	0.133***	---	0.129***	---
	(0.007)		(0.009)		(0.010)		(0.011)	
Post-College	0.137***	---	0.143***	---	0.134***	---	0.132***	---
	(0.015)		(0.019)		(0.016)		(0.020)	
Disability	-0.496***	-0.408***	-0.487***	-0.395***	-0.430***	-0.310***	-0.421***	-0.303***
	(0.010)	(0.014)	(0.013)	(0.018)	(0.009)	(0.008)	(0.013)	(0.009)
Child < 6 years	-0.090***	-0.107***	-0.092***	-0.103***	-0.089***	-0.091***	-0.092***	-0.092***
	(0.007)	(0.014)	(0.010)	(0.016)	(0.006)	(0.013)	(0.008)	(0.015)
Number of Children	-0.067***	-0.049	-0.069***	-0.051***	-0.056***	-0.034***	-0.057***	-0.035***
	(0.003)	(0.005)	(0.003)	(0.006)	(0.004)	(0.004)	(0.004)	(0.005)
Age	0.048***	0.049***	0.048***	0.046***	0.053***	0.041***	0.050***	0.039***
	(0.002)	(0.005)	(0.002)	(0.007)	(0.002)	(0.003)	(0.002)	(0.004)
Age Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.0004***
	(0.00002)	(0.0001)	(0.00002)	(0.0001)	(0.00003)	(0.0001)	(0.00003)	(0.0001)
Black	-0.036***	-0.040**	-0.034**	-0.024	-0.023**	-0.028*	-0.016	-0.013
	(0.008)	(0.016)	(0.012)	(0.019)	(0.009)	(0.014)	(0.012)	(0.017)
Non-MSA	-0.024**	-0.038*	-0.016	-0.017	-0.031***	-0.018	-0.030**	-0.005
	(0.010)	(0.019)	(0.016)	(0.024)	(0.008)	(0.014)	(0.012)	(0.016)
State Unemployment Rate	-0.333*	0.101	-0.850***	-0.312	-0.340	-0.213	-0.516	0.244
	(0.200)	(0.364)	(0.261)	(0.540)	(0.220)	(0.409)	(0.319)	(0.575)
Ln (State Mean Wage)	0.048	0.079	-0.001	0.086*	0.086***	0.109***	0.050***	0.076**
	(0.0239)	(0.049)	(0.017)	(0.047)	(0.025)	(0.037)	(0.012)	(0.031)
Ln (State GDP)	-0.002	0.476**	-0.028	0.509*	-0.064	0.368**	-0.170	0.424**
	(0.130)	(0.190)	(0.226)	(0.284)	(0.105)	(0.155)	(0.207)	(0.182)
State Effects?	Y	Y	Y	Y	Y	Y	Y	Y
Year Effects?	Y	Y	Y	Y	Y	Y	Y	Y
State -Specific Linear and Quadratic Time Trends?	Y	Y	Y	Y	Y	Y	Y	Y
N	57,692	13,629	37,532	9,623	57,692	13,629	37,532	9,623

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

[1]These states include CA, FL, IL, MA, MI, NC, NJ, NY, OH, PA, and TX.

Table 5: Robustness of Estimates of Relationship Between Log Minimum Wage and Employment of Single Mothers, 1989-2004

	Minimum Wage Levels				Alternate Steady Definition		Positive Work Hours Last Year		Lagged Effects	
	Steady		Full-Time						Steady	
	All	< HS	All	< HS	All	< HS	All	< HS	All	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Ln (Minimum Wage)	-0.036**	-0.091**	-0.031	-0.111***	-0.171**	-0.308**	-0.064	-0.322**	-0.063	---
	(0.017)	(0.039)	(0.019)	(0.027)	(0.075)	(0.133)	(0.093)	(0.124)	(0.257)	
Lag [Ln(Minwage)]	---	---	---	---	---	---	---	---	-0.116	-0.173**
									(0.250)	(0.070)
Min Wage Elasticity	*-0.228*	*-0.948*	*-0.254*	*-1.691*	-0.273	*-0.846*	*-0.082*	*-0.583*	*-0.279*	*-0.269*
Ln (Max EITC Benefit)	0.070***	0.048*	0.014	-0.006	0.070***	0.036	0.110***	0.085***	0.022	0.070***
	(0.012)	(0.027)	(0.014)	(0.026)	(0.013)	(0.028)	(0.015)	(0.029)	(0.020)	(0.012)
Work Requirement	0.062***	-0.011	0.041	-0.014	0.046**	-0.005	0.011	-0.034	0.014	0.060***
	(0.016)	(0.048)	(0.026)	(0.043)	(0.021)	(0.045)	(0.019)	(0.031)	(0.012)	(0.016)
Time Limit	-0.012	-0.080	-0.025	-0.050	-0.014	-0.088	0.005	-0.054	0.030**	-0.012
	(0.019)	(0.046)	(0.024)	(0.051)	(0.018)	(0.056)	(0.017)	(0.043)	(0.012)	(0.019)
Family Cap	0.018	0.047	0.031*	0.058**	0.027	0.052	0.015	0.072**	0.014	0.020
	(0.015)	(0.031)	(0.016)	(0.023)	(0.017)	(0.032)	(0.015)	(0.030)	(0.018)	(0.015)
Paternity Enforcement	0.018	0.028	0.046**	0.062	0.030	0.033	0.011	0.049	0.021	0.017
	(0.025)	(0.057)	(0.020)	(0.044)	(0.023)	(0.059)	(0.021)	(0.073)	(0.021)	(0.025)
Ln (Max AFDC-FS3 Benefit)	-0.144	0.232	-0.140	0.046	-0.132	-0.004	-0.111	0.206	-0.098	-0.173
	(0.175)	(0.252)	(0.149)	(0.243)	(0.179)	(0.239)	(0.155)	(0.311)	(0.176)	(0.167)
Less than HS Educ[1]	-0.184***	---	-0.159***	---	-0.184***	---	-0.169***	---	-0.184***	-0.184***
	(0.007)		(0.005)		(0.006)		(0.009)		(0.007)	(0.007)
Some College[1]	0.047***	---	0.043***	---	0.048***	---	0.042***	---	0.047***	0.047***
	(0.005)		(0.005)		(0.006)		(0.005)		(0.005)	(0.005)
College[1]	0.104***	---	0.114***	---	0.101***	---	0.083***	---	0.104***	0.104***
	(0.008)		(0.010)		(0.008)		(0.008)		(0.008)	(0.008)
Post-College[1]	0.125***	---	0.119***	---	0.130***	---	0.099***	---	0.125***	0.125***
	(0.013)		(0.014)		(0.011)		(0.011)		(0.013)	(0.013)
Disability	-0.489***	-0.411***	-0.430***	-0.311***	-0.493***	-0.399***	-0.444***	-0.426***	-0.489***	-0.489***
	(0.009)	(0.013)	(0.009)	(0.007)	(0.008)	(0.012)	(0.007)	(0.017)	(0.009)	(0.009)
Child < 6 years	-0.089***	-0.103***	-0.089***	-0.092***	-0.093***	-0.106***	-0.068***	-0.099*	-0.089***	-0.089***
	(0.006)	(0.013)	(0.005)	(0.012)	(0.007)	(0.013)	(0.007)	(0.015)	(0.006)	(0.006)
Number of Children	-0.068***	-0.052***	-0.057***	-0.037***	-0.067***	-0.051***	-0.062***	-0.058***	-0.068***	-0.068***
	(0.003)	(0.005)	(0.003)	(0.004)	(0.003)	(0.005)	(0.003)	(0.005)	(0.003)	(0.003)
Age[3]	0.050***	0.053***	0.055***	0.044***	0.051***	0.049***	0.024***	0.034***	0.050***	0.050***
	(0.002)	(0.005)	(0.002)	(0.003)	(0.001)	(0.004)	(0.002)	(0.003)	(0.002)	(0.002)
Age Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.003***	-0.0004***	-0.001***	-0.001***
	(0.00002)	(0.0001)	(0.00002)	(0.0001)	(0.00002)	(0.0001)	(0.00002)	(0.00004)	(0.00002)	(0.00002)
Black	-0.036***	-0.044***	-0.023***	-0.028**	-0.042***	-0.042***	-0.034***	-0.028*	-0.036***	-0.036***
	(0.008)	(0.016)	(0.008)	(0.013)	(0.008)	(0.015)	(0.009)	(0.016)	(0.008)	(0.008)
Non-MSA	-0.024***	-0.036**	-0.035***	-0.023**	-0.029***	-0.029*	-0.004	-0.032	-0.024***	-0.024***
	(0.009)	(0.016)	(0.007)	(0.036)	(0.009)	(0.017)	(0.009)	(0.020)	(0.009)	(0.009)
State Unemployment Rate	-0.470**	-0.056	-0.418**	-0.108	-0.483***	-0.379	-0.288	0.077	-0.469**	-0.468**
	(0.182)	(0.338)	(0.204)	(0.393)	(0.201)	(0.359)	(0.202)	(0.421)	(0.182)	(0.182)
Ln (State Mean Wage)	0.041**	0.062	0.064***	0.063*	0.057***	0.089*	0.034**	-0.001	0.042**	0.042**
	(0.021)	(0.045)	(0.018)	(0.038)	(0.020)	(0.047)	(0.016)	(0.038)	(0.020)	(0.020)
Ln (State GDP)	-0.004	0.377*	-0.013	0.306*	-0.050	0.368*	0.108	0.361*	-0.002	-0.002
	(0.106)	(0.201)	(0.093)	(0.157)	(0.107)	(0.202)	(0.120)	(0.214)	(0.107)	(0.107)
State Effects?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Effects?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State -Specific Linear and Quadratic Time Trends?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	76,034	16,370	76,034	16,370	76,034	16,370	76,034	16,370	76,034	76,034

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

Table 6: Estimates of Relationship Between Log Minimum Wage and Hours Worked, Income, and Welfare Receipt of Single Mothers, 1989-2004

	Ln (Annual Work Hours) Among Working		Ln (Annual Income) Among Working			Welfare Receipt		
	All	30 States	All	30 States	All Steady	All	30 States	11 States
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln (Minimum Wage)	-0.236	-0.319**	-0.369**	-0.316**	-0.100	0.044	0.188***	0.208**
	(0.153)	(0.151)	(0.144)	(0.133)	(0.111)	(0.072)	(0.051)	(0.074)
Min Wage Elasticity	*-0.236*	*-0.319*	*-0.369*	*-0.316*	*-0.100*	*0.200*	*0.836*	*0.870*
Ln (Max EITC Benefit)	0.048**	0.058**	0.072***	0.070**	0.020	-0.098***	-0.095***	-0.101***
	(0.023)	(0.027)	(0.026)	(0.029)	(0.017)	(0.012)	(0.013)	(0.014)
Work Requirement	0.141***	0.144***	0.160***	0.151***	-0.020	-0.040***	-0.038**	-0.029*
	(0.030)	(0.032)	(0.032)	(0.037)	(0.031)	(0.014)	(0.015)	(0.016)
Time Limit	-0.100*	-0.069	-0.107**	-0.059	-0.057	0.010	0.017	0.002
	(0.053)	(0.059)	(0.053)	(0.072)	(0.045)	(0.016)	(0.016)	(0.019)
Family Cap	0.020	0.006	0.068**	0.060	0.050*	-0.012	-0.007	0.004
	(0.027)	(0.031)	(0.034)	(0.039)	(0.028)	(0.013)	(0.016)	(0.015)
Paternity Enforcement	0.040	0.008	0.050	0.038	0.014	-0.046*	-0.081***	-0.081***
	(0.047)	(0.052)	(0.050)	(0.077)	(0.046)	(0.026)	(0.017)	(0.016)
Ln (Max AFDC-FS3 Benefit)	-0.168	-0.210	-0.374	-0.314	-0.203	0.173	0.153	0.139
	(0.242)	(0.284)	(0.279)	(0.302)	(0.250)	(0.131)	(0.120)	(0.171)
Less than HS Educ	-0.210***	-0.215***	-0.465***	-0.466***	-0.332***	0.132***	0.134***	0.135***
	(0.014)	(0.017)	(0.013)	(0.014)	(0.016)	(0.011)	(0.013)	(0.018)
Some College	0.037***	0.035***	0.206***	0.229***	0.176***	-0.040***	-0.045***	-0.049***
	(0.009)	(0.011)	(0.017)	(0.016)	(0.010)	(0.005)	(0.005)	(0.007)
College	0.090***	0.084***	0.575***	0.601***	0.506***	-0.087***	-0.091***	-0.098***
	(0.012)	(0.015)	(0.017)	(0.017)	(0.015)	(0.008)	(0.009)	(0.012)
Post-College	0.106***	0.108***	0.807***	0.831***	0.743***	-0.094***	-0.099***	-0.108***
	(0.015)	(0.018)	(0.026)	(0.034)	(0.020)	(0.009)	(0.010)	(0.012)
Disability	-0.703***	-0.715***	-0.924***	-0.976***	-0.339***	0.193***	0.186***	0.187***
	(0.033)	(0.042)	(0.038)	(0.040)	(0.022)	(0.009)	(0.010)	(0.010)
Child < 6 years	-0.098***	-0.100***	-0.112***	-0.110***	-0.019**	0.087***	0.087***	0.089***
	(0.011)	(0.013)	(0.019)	(0.021)	(0.009)	(0.008)	(0.010)	(0.014)
Number of Children	-0.081***	-0.080***	-0.132***	-0.131***	-0.059***	0.069***	0.069***	0.074***
	(0.009)	(0.010)	(0.008)	(0.009)	(0.004)	(0.004)	(0.004)	(0.003)
Age	0.095***	0.092***	0.161***	0.157***	0.094***	-0.023***	-0.021***	-0.020***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.003)	(0.002)	(0.003)	(0.003)
Age Squared	-0.001***	-0.001***	-0.002***	-0.002***	-0.001***	0.0002***	0.0002***	0.0002***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.00004)	(0.00003)	(0.00004)	(0.0001)
Black	-0.039***	-0.034***	-0.103***	-0.093***	-0.068***	0.077***	0.077***	0.079***
	(0.009)	(0.011)	(0.015)	(0.016)	(0.014)	(0.009)	(0.009)	(0.013)
Non-MSA	-0.054***	-0.055***	-0.216***	-0.205***	-0.167***	0.004	0.007	0.022
	(0.014)	(0.018)	(0.026)	(0.027)	(0.018)	(0.009)	(0.015)	(0.015)
State Unemployment Rate	-0.340	-0.395	-0.329	-0.352	0.092	0.213	0.190	0.214
	(0.255)	(0.327)	(0.399)	(0.532)	(0.309)	(0.157)	(0.177)	(0.313)
Ln (State Mean Wage)	0.006	0.023	0.110***	0.142***	0.110***	-0.018	-0.022	-0.014
	(0.038)	(0.033)	(0.038)	(0.047)	(0.027)	(0.019)	(0.022)	(0.030)
Ln (State GDP)	-0.231	-0.350*	-0.344*	-0.519**	-0.110	-0.130	-0.135	-0.062
	(0.158)	(0.200)	(0.201)	(0.214)	(0.190)	(0.089)	(0.101)	(0.198)
State Effects?	Y	Y	Y	Y	Y	Y	Y	Y
Year Effects?	Y	Y	Y	Y	Y	Y	Y	Y
State -Specific Linear and Quadratic Time Trends?	Y	Y	Y	Y	Y	Y	Y	Y
N	58,972	42,403	57,160	42,403	47,391	76,034	57,692	37,532

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

Table 7: Effectiveness of Minimum Wage vs. EITC at Reducing Poverty Among Working Single Mothers, 1989-2004[1]

	< 75% Poverty Line				< 100% Poverty Line				< 125% Poverty Line			
	Steady		Full-Time		Steady		Full-Time		Steady		Full-Time	
	All	30 States	All	30 States	All	30 States	All	30 States	All	30 States	All	30 States
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Ln (Minimum Wage)	0.001	0.068	-0.027	-0.015	0.016	0.064	-0.034	-0.042	0.040	0.127	0.001	0.010
	(0.058)	(0.068)	(0.037)	(0.048)	(0.049)	(0.060)	(0.041)	(0.051)	(0.075)	(0.094)	(0.061)	(0.093)
Ln (Max EITC Benefit)	-0.038***	-0.035**	-0.060***	-0.059***	-0.034***	-0.033**	-0.074***	-0.077***	0.013	0.027	-0.018	-0.001
	(0.012)	(0.014)	(0.020)	(0.014)	(0.012)	(0.013)	(0.010)	(0.013)	(0.013)	(0.015)	(0.016)	(0.017)
State Effects?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Effects?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State -Specific Linear and Quadratic Time Trends?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	48,808	36,091	37,690	27,922	48,808	36,091	37,690	27,922	48,808	36,091	37,690	27,922

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

[1]All models include the full set of individual-level and state-level independent variables described in the previous tables.

Appendix: State Minimum Wages from 1989 to 2004 that were Higher than the Federal Minimum on January 1

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Federal minimum	3.35	3.80	4.25	4.25	4.25	4.25	4.25	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15
Northeast																
New England																
Maine	3.75	3.85	---	---	---	---	---	---	---	---	---	---	---	5.75	6.25	6.25
New Hampshire	3.65	3.75	3.85	---	---	---	---	---	---	---	---	---	---	---	---	---
Vermont	3.65	3.75	3.85	---	---	---	4.75	4.75	5.00	---	---	5.75	6.25	6.25	6.25	6.75
Massachusetts	3.75	3.75	---	---	---	---	---	---	5.25	---	---	6.00	6.75	6.75	6.75	6.75
Rhose Island	4.00	4.25	4.25	4.45	4.45	4.45	4.45	4.45	5.15	---	---	5.65	6.15	6.15	6.15	6.15
Connecticut	4.25	4.25	4.25	4.27	4.27	4.27	4.27	4.27	4.77	---	5.65	6.15	6.40	6.70	6.90	7.10
Middle Atlantic																
New Jersey	---	---	---	5.05	5.05	5.05	5.05	5.05	5.05	---	---	---	---	---	---	---
New York	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pennsylvania	3.70	3.80	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Midwest																
East North Central																
Illinois	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.50
West North Central																
Minnesota	3.85	3.95	4.25	---	---	---	---	---	---	---	---	---	---	---	---	---
Iowa	---	3.85	4.25	4.65	4.65	4.65	4.65	4.65	---	---	---	---	---	---	---	---
South																
South Atlantic																
Delaware	---	---	---	---	---	---	---	4.65	5.00	---	---	5.65	6.15	6.15	6.15	6.15
District of Columbia	4.33	4.33	4.33	4.33	4.33	5.25	5.25	5.25	5.75	5.75	6.15	6.15	6.15	6.15	6.15	6.15
East South Central																
None	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
West South																
None	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
West																
Mountain																
None	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pacific																
Washington	3.85	4.25	4.25	---	---	4.90	4.90	4.90	4.90	---	5.70	6.50	6.72	6.90	7.01	7.16
Oregon	---	4.25	4.75	4.75	4.75	4.75	4.75	4.75	5.50	6.00	6.50	6.50	6.50	6.50	6.90	7.05
California	4.25	4.25	4.25	---	---	---	---	---	---	5.00	5.75	5.75	6.25	6.75	6.75	6.75
Pacific (noncontiguous)																
Alaska	3.85	3.85	4.30	4.75	4.75	4.75	4.75	4.75	5.25	5.65	5.65	5.65	5.65	5.65	7.15	7.15
Hawaii	3.85	3.85	---	4.75	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.75	6.25	6.25

Source: Updated from Burkhauser et al. (2000), Fiscal Policies Institute (2004), and the U.S. Department of Labor

In 1990 and 1991, the federal minimum wage was not implemented until April 1. Thus, some states listed in the table have a higher state minimum wage than the federal minimum wage from January to March in those years. In 1996 and 1997, the federal minimum wage was not implemented until October 1. Thus, some states listed in the the table have a higher state minimum wage than the federal minimum wage from January to September in those years.