

Article

The Relative Effectiveness of the Minimum Wage and the Earned Income Tax Credit as Anti-Poverty Tools

Joseph F. Quinn¹ and Kevin E. Cahill^{2,*}

¹ Department of Economics, Boston College, Chestnut Hill, MA 02467-3859, USA; joseph.quinn@bc.edu

² Center on Aging & Work, Boston College, Chestnut Hill, MA 02467-3859, USA

* Correspondence: kevin.e.cahill@bc.edu; Tel.: +1-857-222-4101

Academic Editors: Kenneth Himes and Kate Ward

Received: 13 February 2017; Accepted: 6 April 2017; Published: 17 April 2017

Abstract: In the search for effective measures to combat poverty, two government policies have been given much attention. One is the establishment of a federal minimum wage to help workers secure a decent standard of living. The second measure is the Earned Income Tax Credit, which gives tax refunds to workers in households that fall below a set standard of income. Both policies have supporters and critics regarding the effectiveness of the policies. This essay provides an economic analysis of the two measures. Among the issues discussed are how the policies affect employment and poverty, and how well targeted they are at the population at risk.

Keywords: minimum wage; earned Income Tax Credit; employment; poverty line; cash transfers; in-kind transfers; anti-poverty measures

Capitalist and other societies generate income distributions that many view as unacceptably unequal, so governments intervene to alter these market outcomes. Modern developed countries typically have progressive personal income tax structures, in which citizens pay no federal income tax on some amount of income (that amount usually based on family size), and then pay marginal tax rates that increase with taxable income. The goal of such systems is to generate average tax rates that increase with the level of income, making after-tax distributions less unequal than pre-tax ones^{1,2} In addition, governments make transfer payments to households, many of which also make the income distribution less unequal. In the United States, we have important cash and in-kind transfer programs. Cash programs include Social Security, unemployment compensation, workers compensation (for injuries on the job), Supplementary Security Income, and Temporary Assistance for Needy Families (formerly Aid to Families with Dependent Children.) Even more resources are transferred through in-kind (non-cash) programs such as Medicare and Medicaid, food stamps (now SNAP, the Supplemental Nutrition Food Program), housing assistance and Pell grants, in which

¹ In addition to making after-tax incomes less unequal, economists have noted three additional objectives of tax systems: economic stabilization (i.e., to move towards full employment), intergenerational equity (i.e., to maintain fairness between generations), and market efficiency (e.g., to minimize distortions to decision making) (Mankiw 2008). Regarding the first objective, economists at the Federal Reserve Bank of Boston find that, while federal taxes do indeed mitigate wage inequality, the impact varies by state due to differences in state tax policies. Further, the authors find that the impact of taxation on inequality has been relatively constant over time, so that increases in before-tax wage inequality since the mid-1980s have led to increases in after-tax wage inequality (Cooper et al. 2011).

² In addition to making after-tax incomes less unequal, economists have noted three additional objectives of tax systems: economic stabilization (i.e., to move towards full employment), intergenerational equity (i.e., to maintain fairness between generations), and market efficiency (e.g., to minimize distortions to decision making) (Mankiw 2008). Regarding the first objective, economists at the Federal Reserve Bank of Boston find that, while federal taxes do indeed mitigate wage inequality, the impact varies by state due to differences in state tax policies. Further, the authors find that the impact of taxation on inequality has been relatively constant over time, so that increases in before-tax wage inequality since the mid-1980s have led to increases in after-tax wage inequality (Cooper et al. 2011).

the aid is a particular form of assistance, not the cash with which to purchase it³. Some programs are need-based, like Medicaid and housing assistance, with income and often asset requirements; others, like Social Security, Medicare, and unemployment and workers' compensation, are not.⁴

These very important alterations to the income distribution occur *after* market incomes like earnings and returns on assets have been generated. But countries intervene to affect market income as well. Two very important programs are designed to increase the market earnings of some workers: minimum wage policies set by various levels of government (the federal government as well as some states and a few cities), which are now very much in the news, and the federal Earned Income Tax Credit (EITC), a much less well understood but also very important program. Both aim to alter the final distribution of income and, at the lower end, to reduce the extent and impact of poverty. In this paper, we will discuss the pros and cons of both, particularly their effectiveness as anti-poverty tools.

1. The Minimum Wage in the United States

The 1938 Fair Labor Standards Act, which legislated the first federal minimum wage of \$0.25/hour, emerged from the ravages of the Great Depression.⁵ It was controversial then and has remained so to this day. Prior federal and state minimum wages laws had been struck down as unconstitutional by a 5-4 United States Supreme Court decision, which deemed them a violation of freedom of contract. This unpopular judicial decision earned the ire of President Franklin Roosevelt, who criticized "nine old men," and it prompted his threat to increase the size of the Court by adding six sympathetic justices. One sitting justice quickly saw the light and reversed his vote on a similar case in 1937, deeming the minimum wage constitutional after all, paving the way for the historic 1938 legislation and generating the quip, "a switch in time saved nine" (Grossman 1978).

Congress has increased the federal minimum wage 22 times, most recently in 2007, 2008 and 2009, when it was raised to \$5.85, \$6.55 and then \$7.25 per hour, where it remains today.⁶

As seen in Figure 1, the minimum wage peaked in 1968 at \$1.60/hour, which is \$10.86/hour in current (2015) dollars. Since the peak, the real value (all in 2015 dollars) fell by 46 percent to \$6.04 in 2006, rose back to \$7.98 in 2009 following the three increases in three years, and has since declined to \$7.25/hour in 2015—one-third below its peak. Without a legislative increase, the real value of the minimum wages declines each year with inflation.

State minimum wages are higher than the federal standard in 29 states and the District of Columbia, led in 2016 by DC (\$11.50), California (\$10.00) and Massachusetts (\$10.00). The federal minimum wage applies in 16 states that have minimum wages the same as or lower than the federal level, and the remaining five, all in the south, that have no state minimum wage.⁷ Unlike the federal government, 11 states currently index their minimum wage to the cost of living, and another four will soon do so (National Employment Law Project 2016). New York State and California have passed \$15/hour

³ In-kind benefits provide considerably more assistance than cash benefits do and the ratio of in-kind to cash has been growing over time (Glaeser 2012).

⁴ In subtle ways, Social Security and Medicare do have need-based components. For example, although the Social Security benefit one receives after reaching one's full retirement age does not decline as current earnings or income rise, a proportion of the benefit becomes taxable if one's income is high enough (Purcell 2015). Similarly, although Medicare eligibility does not depend on income, as Medicaid eligibility does, the premiums paid for Medicare Parts B and C do rise with income (Kaiser Family Foundation 2015).

⁵ The first minimum wage was passed in New Zealand in 1894. Massachusetts passed the first state minimum wage in the U.S. in 1912, and 16 other states and the District of Columbia followed suit by 1930 (BeBusinessed.com 2016).

⁶ The Fair Labor Standards Act (FLSA) establishes the federal minimum wage and covers about 84% of workers in the labor force (Bradley 2015). Excluded are some seasonal workers (e.g., in summer camps or amusement parks), some agricultural workers (e.g., family members), casual babysitters and newspaper deliverers. In addition, some workers are temporarily exempt from coverage. There is a lower teenage minimum of \$4.25/hour for first 90 days of employment, and full time students in retail, service, agriculture, or at an institution of higher learning can be paid 85% of the federal minimum wage. Finally, there is a lower minimum wage (\$2.13/hour) for those who depend heavily on tips, but the regular minimum wage applies to the sum of salary and tips.

⁷ The Congressional Budget Office (CBO 2014, p. 4) estimates that "about half of workers in the United States live in states where the applicable minimum wage is more than \$7.25/hour."

minimum wages, to be phased in over time, by 2021 for New York City and its suburbs and by 2022 statewide in the case of California (Lazo and Orden 2016). More than two dozen localities, including Seattle, San Francisco, Los Angeles and Chicago, have adopted minimum wages in excess of their state minimum (Economic Policy Institute 2016). There is discussion by some of raising the national minimum to \$9.00, \$10.10 or \$15.00/hour over the near future (Cooper and Hall 2013; Nicholas 2016). The 2016 Democratic Party Platform (Democrats.org 2016, p. 3) labels the current minimum wage “a starvation wage” and proposes increasing it to \$15/hour and indexing it to the cost of living. Many interested parties, especially business owners (and most importantly, restaurants and other food providers) oppose these proposed minimum wage increases in part because they increase the cost of production.



Figure 1. Minimum wage rate in nominal and 2015 dollars (Kurtz and Yellin 2016).

Is a minimum wage, or an increase in the minimum wage, a good public policy?⁸ Whom does it help and whom does it hurt, with particular interest on those earning at the low end of the earnings distribution. The good news and the bad news can be illustrated in a very simple graph showing the supply and demand curved in a competitive low-skilled labor market (Figure 2).

Without a minimum wage, the market-clearing (supply = demand) wage is W_{before} and the number of workers employed is E_{before} . If the market wage is higher or lower than this, there will be pressures driving the wage toward equilibrium, either an excess supply of unemployed workers driving the wage down or an excess demand by employers driving the wage up.

If we now introduce a minimum wage of W_{after} , above the prior equilibrium wage, we see that employment declines (fewer workers are hired at the higher wage) but the wages of those still employed (E_{after}) have increased. Employment declines for two reasons. Even if the level of production in a firm now paying a higher wage stays the same, employers might shift (and more so in the long run than immediately, as adjustments take time) from the now relatively more expensive input (labor) to alternative inputs (like capital or technology)—this is the substitution effect. In addition, however, if the prices of the products produced increase because of the higher input costs, total sales may decline, further decreasing the demand for labor across the wage distribution (the output or scale effect). In addition, a higher minimum wage might discourage firm openings and/or increase the rate of firm closings. In the end, some workers will be better off (those still employed but at a higher wage), but others, and some among those that minimum-wage legislation is designed to help, will be worse off. They were employed at the lower minimum-wage but are now unemployed at the higher

⁸ There are extensive literatures on various impacts of the minimum wage. Appendix B in (CBO 2014) lists five pages of references, including 14 reviews of the literature.

minimum-wage. Given turnover in the low-wage sector, some individual workers may be both worse off (e.g., laid off from one job after an increase in the minimum wage) and then better off (hired at a new position at the higher wage) or the reverse.

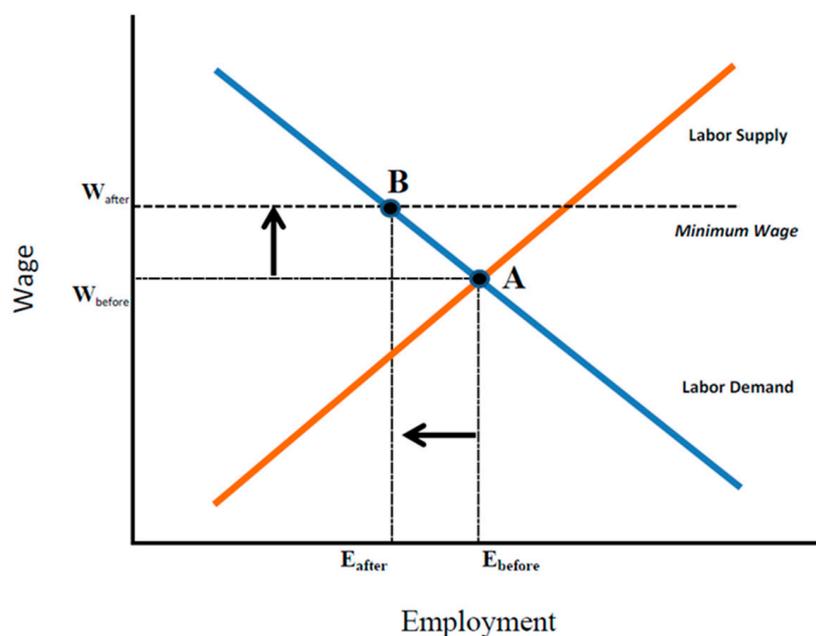


Figure 2. How a minimum wage impacts employment (Authors' illustration).

Others in society can be affected as well. Workers already earning above but near a new higher minimum wage might enjoy pay increases as well (good news for those workers), as employers try to maintain traditional wage differentials among various categories of employees—but some of these better paid workers might be laid off as well (bad news for them). Workers with collectively bargained wages tied to the minimum wage would also gain. If prices of products in this industry rise, as noted above, consumers of these products will pay more, consume less and be made worse off. Demand for components of these products might decrease, with ripple effects in other industries. And of course those paying the higher minimum wages (the employers directly affected) may be worse off as well, earning lower profits as production costs rise and sales volumes decline.

Some of these effects may be partially offset. Those now earning more might purchase more of these now higher priced products. At higher wages, these jobs are now more attractive to workers, which might instill a higher work ethic leading to lower turnover, which saves employers hiring and training costs, and to higher productivity.

There are societal implications as well. Higher paid workers will pay more in income taxes and may rely less on federal, state and local transfer payments. But those laid off will do just the opposite. Overall, earnings inequality and therefore income inequality may decline, which is one of the goals of minimum wage advocates.

Many economists, even those on opposite sides of the minimum wage debate, would agree on the *direction* of these effects. An increase in the minimum wage is likely to increase the income of those affected workers who are still employed and may reduce inequality, turnover, and welfare expenditures. The higher minimum wage may also reduce employment in the low-wage market, increase product prices and lower profits. But these same economists may disagree dramatically on the *magnitude* of these effects, and on the characteristics of the individuals on whom they fall. How many low-wage workers will remain employed at the higher wage? How many will be laid off? Who are those who are laid off? Are they family breadwinners on whose earnings other rely or are they supplementary workers or teenagers looking for summer jobs? If the latter, which teenagers are

they—those in middle-income or wealthy families, looking for some spending money or inner city youth looking for desperately needed income and vital job experiences? Although those affected are clearly low-wage *earners*, if they are earning near the minimum wage, are they members of low-income *households*? How should policymakers and society compare the gains of the winners and the losses of the losers? Does the good news justify the bad?

It is interesting to note the diversity of opinion among economists on the magnitude of the dis-employment effects of an increase in the minimum wage. The Initiative on Global Markets ([The Initiative on Global Markets 2015](#)) at the University of Chicago Booth School of Business periodically surveys a panel of about 50 prominent economists about a series of economic statements, including, in 2015, “If the federal minimum wage is raised gradually to \$15-per-hour by 2020, the employment rate for low-wage US workers will be substantially lower than it would be under the status quo.”⁹ The results are symmetrical. About one-quarter of these economists agree, another quarter disagree and most of the remainder are uncertain.

Researchers in this field also disagree on these issues, but the current dominant view is that the magnitude of the job loss would be modest for moderate increases in the minimum wage.¹⁰ In a recent book that surveys this extensive literature, ([Belman and Wolfson 2014](#)) conclude that,

“Bearing in mind that the estimates for the United States reflect a historic experience of moderate increases in the minimum wage, it appears that if negative effects on employment are present, they are too small to be statistically detectable.”¹¹ ([Belman and Wolfson 2014](#), p. 178)

and that, of the research that has avoided some statistical problems they describe,

“little has been able to detect a substantially significant response of employment, measured as the number of jobs, the number of people working, or the number of hours. Although this does not close the issue, the preponderance of the evidence currently leans that way...The corresponding elasticities for eating and drinking establishments in the United States appear to be somewhat larger, with precision weighted means near -0.05 .” ([Belman and Wolfson 2014](#), p. 402)

The latter estimate suggests that for each 1% increase in the minimum wage, employment in these establishments would decline by 0.05%. If correct, a 50% increase (e.g., from the current \$7.25 to \$10.87/hour) could decrease employment by 2.5%, and doubling the minimum wage to \$14.50 would create a 5.0% decline in employment. It should be noted that the research on which these estimates are based typically studied prior changes in minimum wages or differentials in the minimum wage in different geographic regions, and extrapolations from these historical experiences to very different hypothetical minimum wages (e.g., to \$15/hour) are accompanied by increasing uncertainty in the estimated impacts.

A recent study by the nonpartisan Congressional Budget Office (CBO) ([CBO 2014](#)) tried to estimate the effects of a change in the federal minimum wage from 7.25 to \$10.10/hour—a nearly 40 percent increase—over three years. They note that the employment effects can differ dramatically by firm,

⁹ For a list of the economists surveyed and the results see ([The Initiative on Global Markets 2015](#)).

¹⁰ This is not the universal view. For example, in a Wall Street Journal op-ed, David Neumark ([Neumark 2015](#)) argues that “the evidence is piling up that minimum wages kill jobs,” and notes that the elasticities on job displacement differ by demographic group, and are higher for teenagers and for those with very low skills. See also ([Neumark and Wascher 2008](#), p. 286) for an extensive review of the literature at that time. In their conclusions, they emphasize the “reduction in employment opportunities for low-skilled and directly affected workers” and find “virtually no evidence that minimum wages reduce the proportion of families near or below the poverty line . . . ”

¹¹ Burkhauser ([Burkhauser 2015](#), p. 5) notes that European minimum wages are typically higher relative to the average wage than they are in the U.S., and that “there has been almost no evidence for adverse employment effects.” The fact that recent changes in the U.S. (real) minimum wage have been modest, and that those historical experiences provide the data on which projections of the impacts of future change will be based, should give one pause when dramatic increases in the minimum wage (e.g., to \$10.10, \$12 or \$15/hour) are being considered. Unless the impacts are linear, and there is no reason to believe they are, past experiences may be a poor guide for future impacts.

depending, among other things, on the importance of wage costs in the total costs of production, on the firm's ability to substitute other factors of production for labor, and on the price sensitivity of their customers.¹² The impacts will also increase over time, as firms find additional ways to reduce the use of more expensive inputs. On the other hand, some firms might be able to minimize the employment impacts, if they can reduce other components of compensation (like training or fringe benefits, admittedly less likely in these low-wage settings) in response to the increased wage.

The CBO notes that, as mentioned above, workers making slightly above the new minimum wage (in this case, already making more than \$10.10/hour) might also enjoy wage gains, as workers below them receive raises and employers try to maintain prior wage differentials. The authors assumed that these positive "ripple effects" might occur up to a wage 50 percent higher than the increase in the actual minimum wage; in this case, up to \$11.50/hour.¹³

The CBO's best estimate is that at the end of the three-year transition period to a \$10.10/hour minimum wage, employment would be reduced by about 500,000 workers, a decline of about 3% of the workers affected.¹⁴ This is the bad news. The good news is that the rest of the covered low-wage workers—those still employed, about 16.5 million of them—would have higher earnings because of the change. The winners at this stage outnumber the losers by over 30:1. But these changes in earnings (to losers and winners) are only the first stage effects. The CBO also estimates the negative impacts of product price increases, the positive impacts of increases in demand for goods and services by those now earning more, and the losses in income of those business owners now paying the higher wages.

Figure 3 illustrates the estimated increases in net earnings for low-wage earners and the aggregate effect on families' real income, disaggregated by the ratio of family income to the appropriate poverty threshold (anticipating our next topic—the anti-poverty efficacy of minimum wage legislation). The dark blue bars show just the changes in earnings (both increases to those still employed at \$10.10/hour and losses to those who lose their jobs). The light blue bars include the other impacts on real incomes as well, several of which are negative, like price increases and reduced profits. The sum of the light blue bars for the families *up to 6 times* their poverty threshold is +\$19 billion (in 2013 dollars), with \$5 billion going to families below the poverty line, \$12 billion to families between 1 and 3 times the line and \$2 billion to those between 3 and 6 times the line. The big losers are those families *above 6 times* the poverty line, who reap very little of the good news (higher wages for low wage workers) and much of the bad news (like higher prices and lower profits), with a net loss summing to −\$17 billion (see (CBO 2014), Figure 3).¹⁵ The net result for all those affected (+19b − \$17b = +\$2b) is nearly a wash, but the redistribution is progressive, with families at the lower end and in the middle of the income distribution in aggregate better off and those at the very upper end worse off. The vast majority of the net gain goes to workers in families above the poverty line, although some of the net gain goes to those close to it (within 2 times their poverty threshold). Below we will compare these anti-poverty results with those of an important alternative, the Earned Income Tax Credit.

¹² The importance of the cost of other factors of production suggests that the impact of a minimum wage increase will differ geographically. A given increase in a firm's labor costs in a rural area, where rents and other costs are low, will have a much larger percentage impact on total costs than the same increase in the wage bill would have in Manhattan, where rents and other costs are much higher. The more important wages are in total costs, the larger the likely impact of change in the minimum wage.

¹³ The increase analyzed, from \$7.25 to \$10.10, is an increase of \$2.85/hour. An increase 50% larger than that would be an increase of \$4.27/hour. Adding that to the original \$7.25 yields \$11.52, rounded to the \$11.50/hour used in the CBO study.

¹⁴ This 500,000 decline includes only workers who would have made less than \$10.10/hour before the increase in the minimum wage. The authors assume some of those already earning slightly above \$10.10/hour (up to \$11.50/hour—see footnote 11) would enjoy some wage increase (the "ripple effect"), but none would suffer job losses. This −500,000 is the researchers' best estimate. Their 67% confidence interval for the loss in jobs ranges from approximately 0 to a loss of 1 million, implying a 33% chance that the change could be outside that range, from a gain in employment to a loss of over 1 million jobs.

¹⁵ In 2016, 6 times the poverty line is roughly \$120,000 for a family of three and \$150,000 for a family of 6. See (CBO 2014, p. 11).

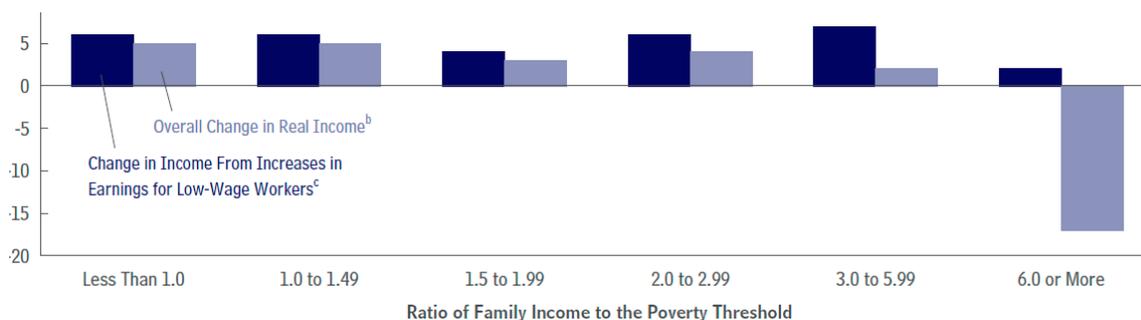


Figure 3. Estimated effects on real family income of an increase in the federal minimum wage, second half of 2016, \$10.10 option^a (billions of 2013 dollars, annualized). See (CBO 2014). Notes: Calculated using before-tax family cash income. Poverty thresholds vary with family size and composition. The definitions of income and of poverty thresholds are those used to determine the official poverty rate and are as defined by the Census Bureau. CBO projects that in 2016 the poverty threshold (in 2013 dollars) will be about \$18,700 for a family of three and \$24,100 for a family of four. a. The minimum wage would rise (in three steps, starting in 2014) to \$10.10 by 1 July 2016, and then be indexed to inflation. b. Changes in real (inflation-adjusted) income include increases in earnings for workers who would receive a higher wage, decreases in earnings for workers who would be jobless because of the minimum-wage increase, losses in income for business owners, decreases in income because of increases in prices, and increases in income generated by higher demand for goods and services. c. Increases in earnings for workers who are projected, under current law, to be paid less than \$11.50 per hour.

Douglas Holtz-Eakin and Ben Gitis (Holtz-Eakin and Gitis 2015) duplicated the CBO analysis for larger minimum wages increase, to \$12/hour and \$15/hour by the year 2020, both of which have been proposed.¹⁶ They used the CBO methodology, as well as some higher dis-employment effects proposed by other researchers: Jonathan Meer and Jeremy West (Meer and West 2016), who estimated intermediate-sized job loss effects, but much larger than the CBO estimates, and Jeffrey Clemens and Michael Wither (Clemens and Wither 2014), who estimated extremely large dis-employment effects.

The Holtz-Eakin and Gitis results using the CBO methodology are qualitatively similar to the \$10.10/hour minimum wage estimates discussed above.¹⁷ For example, following an increase to \$12/hour, about 1.3 million jobs would be lost, but 37 million affected workers (earning up to \$14.40/hour) would still be employed—a good news : bad news ratio of about 28:1.¹⁸ For the larger increase to \$15/hour, 3.3 million workers would lose their jobs but 52 million would be employed at a higher wage, a ratio of almost 16:1. In terms of individuals, the number enjoying the good news significantly outweighs the number suffering the bad, although the loss in economic well-being and morale for an individual now without a job most likely outweighs the increase in well-being for someone who remain employed at a higher wage (Sabia 2014b, p. 1045). How one weighs the numbers who are better and worse off versus the differential impact of the change per person still employed

¹⁶ See (Holtz-Eakin and Gitis 2015, p. 4, footnotes 8–9).

¹⁷ For example, Holtz-Eakin and Gitis (Holtz-Eakin and Gitis 2015, Figures 1–4) used the same definition of workers already earning above the minimum wage who might nonetheless enjoy a wage increase—up to wage rates 50% higher than the difference between the old and new minimum wage (see footnote 11). In their \$12/hour example, the ripple effects (higher wages after an increase in the minimum wage) occur up to \$14.40/hour and in the \$15/hour case, up to \$18.90/hour.

¹⁸ Holtz-Eakin and Gitis (Holtz-Eakin and Gitis 2015, p. 6) estimate that 25.8 million workers would have earned between \$7.25 and \$12/hour and another 12.5 million between \$12 and \$14.40/hour in the absence of an increase in the federal minimum wage, for a total of 38.3 million affected by the increase. Of those, following the increase, 1.3 million would lose their jobs and be worse off, and the remainder (37.0 million) would keep their jobs at the higher wage and be better off. In the \$15/hour case, 55.1 million (those earning between \$7.25 and \$18.90/hour) would be affected, 3.3 million would lose their jobs and the remaining 51.8 million would remain employed.

versus now unemployed is one reason why analysts can differ in their views on increases in the minimum wage.¹⁹

2. The Earned Income Tax Credit

The federal Earned Income Tax Credit (EITC) is a wage supplement, via a refundable tax credit, to wage earners in low- and modest-income families. It increases hourly earnings, just like a raise, if the family's income is low enough, and it is designed to encourage work.

The EITC does not change one's gross paycheck. Rather, with each hour worked by anyone in the family, the credit first negates any income or Social Security taxes the family owes for the year, and then any additional unused credit is refunded to the family after the annual tax forms are filed. The fact that the credit is *refundable*, and does not only cancel taxes owed, is very important because, although nearly all workers pay Social Security taxes, from the first dollar earned, almost half (about 45% in 2015) of the households in the United States do not have enough income to owe federal income taxes (Tax Policy Center 2015).

Figure 4 illustrates how the EITC works, in this case, for a married couple with two children in 2015 (CBPP 2016c). Family earnings are supplemented by about 40 percent up to a maximum of \$5,548 per year, which occurs when earnings reach about \$14,000.²⁰ The annual EITC remains at this level as family earnings increase to about \$23,400, during which workers earn just their wage from their employer. After this flat range on the graph, the supplement declines by about \$0.20 for each additional \$1 earned, until it disappears at earnings of just over \$50,000. During this downward section, the worker actually nets less than the wage from the employer, because the EITC declines with each hour worked, providing a work disincentive along this range of the graph. For a single head of household with two children, the first part of the graph is the same but the decline starts earlier, at earnings of about \$18,000. For a couple with three children, the maximum EITC and the earnings at which it declines to \$0 are both higher (\$6,242 and about \$53,500); with one child, both are lower (\$3,359 and about \$44,800). The EITC once applied only to families with children. Low earners without children are now eligible, but for a maximum of only about \$500 per year, or less than \$10 per week.²¹ Although the amount of the EITC depends on the head of household (single or couple) and the number of children (up to a maximum of 3), the structure of the benefit always looks like Figure 4, with a wage supplement up to a maximum amount, which then stays constant for a while and then declines at a rate lower than the increase. The EITC acts as a supplement (of about 40%) to the wage rate on the way up, and then acts as a tax (of about 20%) on the way down, since the credit declines as anyone in the family earns more.

In 2013, the average EITC recipient with children received about \$3100 (CBPP 2016c). The grant differs significantly by number of children as seen in Figure 5. Families of three or more children averaged over \$4000 (in 2013), those with three children about \$3700, those with one child about \$2300 and those with no children less than \$300 (CBPP 2016b). The District of Columbia and 26 states supplement the federal EITC, usually adding a percentage to the federal grant (Marr et al. 2015).²²

¹⁹ The number of individuals who are better off and worse off could also be influenced by migration if higher minimum wages attract low-skilled immigrants or induce relocations among recent migrants. A recent review of the literature on migration flows in response to minimum wage laws concludes that the evidence is mixed regarding these potential migration effects (Giulietti 2015).

²⁰ Unlike the federal minimum wage, which changes only with legislation, the EITC amounts change each year. For example, the 2015 maximum EITC for a household with two qualifying children, \$5,548, increased marginally to \$5,572 in 2016. Eligibility also requires that the family have less than \$3,400 in investment income for the year. See (IRS 2016a).

²¹ How the EITC amount changes with head of household (single or couple), number of children (0 to 3) and family earnings can be seen in a neat interactive graph available at the Center for Budget and Policy Priorities (CBPP 2016b).

²² Of the states (and DC) that supplement the federal EITC, 24 have refundable grants, like the federal program; four have non-refundable grants, meaning that they can decrease or eliminate tax obligations but any remainder does not go to the family (CBPP 2016d).

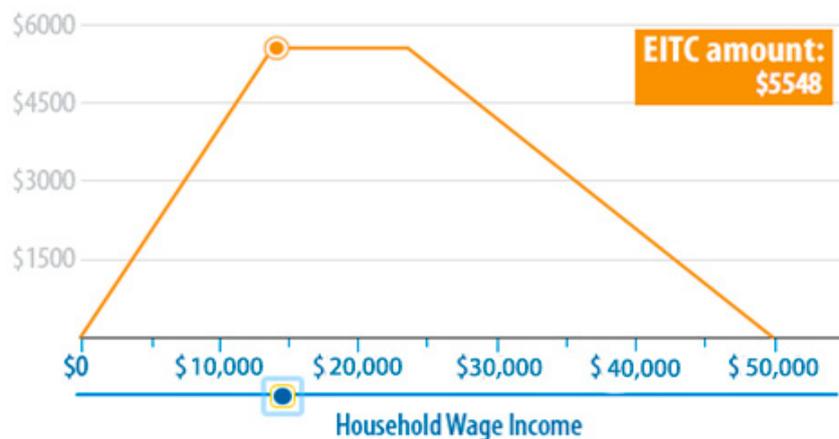


Figure 4. Value of federal Earned Income Tax Credit, 2015 (filing status: married, two children, \$14,162 in household wage income). See (CBPP 2016c).

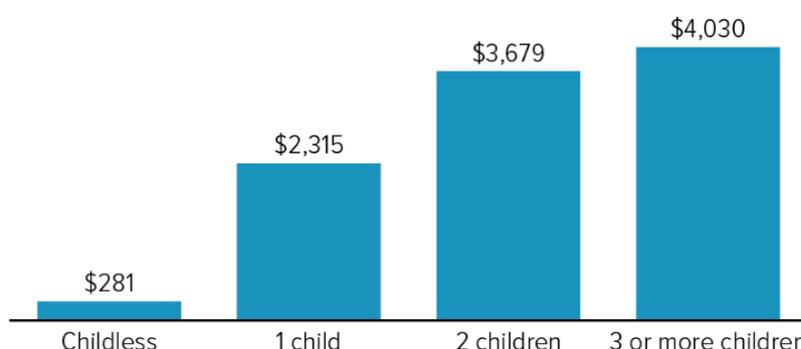


Figure 5. Average Earned Income Tax Credit benefit. See (Center for Budget and Policy Priorities (CBPP 2016b)).

Figure 6 illustrates the impact of the EITC on a low-wage labor market for someone on the upward section of Figure 4. Point A is the market equilibrium with no minimum wage and no EITC, with E_{before} workers employed at wage W_{before} . The EITC then creates a positive wedge between what the employer pays per hour ($W_{\text{after}}\text{-employer}$, assumed to be above the minimum wage) and what the worker receives ($W_{\text{after}}\text{-employee}$)—with the EITC subsidy (per hour) creating the difference. At the new equilibrium, point B, labor supply (which depends on $W_{\text{after}}\text{-employee}$ —the wage rate received by the employee, including the EITC) equals labor demand (which depends on $W_{\text{after}}\text{-employer}$ —the lower amount paid by the employer).

Note that compared to the single wage before the EITC, W_{before} , the worker earns more and the employer pays less. The government subsidy is shared, and who gets what proportion of the subsidy depends on the shapes (the elasticities) of the supply and demand curves.²³

The most important feature of this graph, and a crucial difference from the minimum wage example in Figure 2, is that employment *increases*. Employees want to work more because they are

²³ In Figure 5, the subsidy appears to be shared about equally, but that is just because of how these supply and demand curves are drawn; there is no reason to expect equal sharing in a real case. Bernstein and Shierholz (Bernstein and Shierholz 2014, p. 1038) cite (Rothstein 2010) who estimates that employers capture about one-quarter of the subsidy via lower pre-tax wages. Rothstein (Rothstein 2010, pp. 6, 205) concludes that “under reasonable demand elasticities substantial portions of the funds expended on the EITC are shifted to employers . . . Although the exact magnitudes of these effects are sensitive to the details of the simulation, their qualitative importance is quite robust.”

earning more; employers want to hire more because they are paying less. Both sides gain, with that gain funded by taxpayers, who may very well include these employers and employees.

The EITC appeals to many. Many conservatives like it because it encourages work, it helps only those who do work, and it increases total employment. Many liberals like it because it helps workers who live in poor or modest-income households. Many employers like it because it is funded by taxpayers, not just by employers, and because the wages they pay might decline, as seen in Figure 6. Many economists like that it encourages work and because it is well targeted, not on those earning low wages, who may live in wealthy households, but rather on those living in low-income households, a topic to be discussed further below.

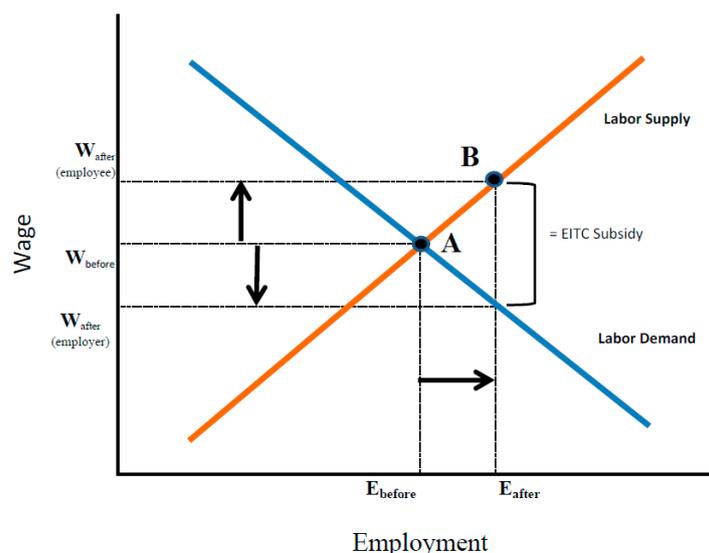


Figure 6. How the Earned Income Tax Credit impacts employment (Authors' illustration).

The EITC is a large and very important federal program. In 2014, over 27 million Americans received nearly \$67 billion in refundable credits (IRS 2016b). It is about the same size as the Supplemental Nutrition Assistance (food stamps) Program (\$75 billion in 2015), is larger than federal housing assistance to low-income households (\$50 billion in 2014), and is much larger than traditional welfare, Temporary Assistance for Needy Families, formerly AFDC (less than \$20 billion in 2014). The IRS (IRS 2016b) estimates that about 80 percent of those who are eligible for the benefit file tax forms, and apply for and receive the EITC. Among those eligible who do not apply are disproportionately the self-employed, rural residents and those not proficient in English, and some of those who do not claim the EITC might be eligible for only small amounts, and deem it not worth the effort. Outreach programs exist to reach and inform those who are missing out on these benefits (IRS 2016b).

Although both the minimum wage and the EITC can raise a worker's wage, they differ in important ways. First, unlike the minimum wage, the benefit of which appears in each paycheck, the EITC is refunded just once per year, via the income tax system. This may be a disadvantage to those who would like to increase weekly expenditures, or an advantage to others who then purchase or repair durable goods with the lump sum payment. Second, the EITC is funded by the government (by taxpayers), through foregone tax receipts and checks for the remainder, not by employers, who pay the minimum wage and who pay more when it is increased. In fact, as we will see below, employers might actually be beneficiaries of the EITC, capturing some of the benefit by paying lower wages.

3. The Anti-Poverty Effectiveness of the Minimum Wage and the EITC

Among the goals of both the minimum wage and the EITC is improving the financial status of those at the lower end of the income distribution, which includes those below and those above but near

the poverty line. As noted above, the (CBO 2014) estimates that about 16.5 million low-wage (earning less than \$10.10/hour) workers would receive higher wages with a \$10.10/hour federal minimum wage, as would some additional workers earning up to \$11.50/hour.²⁴ The light blue bars in Figure 3 show the changes in earnings disaggregated by family income, measured here as multiples of the each family's poverty threshold, which depends on family size. In total, the increase in the minimum wage to \$10.10/hour raises aggregate earnings by \$31 billion per year (CBO 2014, p. 2). Of that \$31 billion, less than one-fifth (19%) goes to poor families, about one-third (32%) goes to families between 1 and 2 times the poverty line, another fifth (19%) to those between 2 and 3 times the line, nearly a quarter (23%) to families between 3 and 6 times the poverty threshold, and the remaining 6 percent to those over 6 times the poverty line (derived from (CBO 2014, figure 3)). If we define those below 1.5 times the poverty line (in 2016, 1.5 x the poverty line = \$36,375 for a family of 4) as poor and near-poor, they reap less than 40 percent of the total increase in earnings. If we include all below 2 times the line (\$48,500 for a family of 4), they get about half of the gain, with the other half going to families above 2 times and almost 30 percent going to those in families over 3 times the poverty threshold (\$72,750).

Holtz-Eakin and Gitis perform a similar exercise, focusing on the net pay change following minimum wage increases to \$12 and \$15/hour. As seen in Table 1, very little of the gain goes to those below the poverty line (8% in the \$12/hour case and 7% in the \$15/hour case)—even less than in the \$10.10 example because the impacts reach higher up into the wage distribution. The majority of the gain goes to those between 1 and 3 times the poverty threshold (45%–47%) and almost half (45%–48%) goes to families far from poverty.

Table 1. Percentage distribution of new pay change, by income level, from a minimum wage level of \$12/hour and \$15/hour. See (Holtz-Eakin and Gitis 2015, Tables 8 and 10).

Poverty Level	Percentage Distribution of New Pay Change (%)	
	\$12/hour	\$15/hour
less than 1x	8.1	7.0
1x–3x	46.9	45.1
3x–6x	33.3	35.0
6x plus	11.7	13.0

Why is the minimum wage poorly targeted? The minimum wage focuses on the *hourly earnings of individuals*, while the EITC focuses on the *total income of families*—a much better indicator of financial well-being. The CBO (CBO 2014, table 3) estimates that only about half of low-wage workers (making less than \$11.50/hour) are in families with income below 2 times their poverty threshold, and only 20 of that 50 percent are in families below the poverty line; that is, officially poor. Of the other half of low-wage earners, nearly 20 percent are in families between 2 and 3 times the line, almost a quarter are in families between 3 and 6 times the line, and 9 percent of low-wage workers reside in families with income more than 6 times their poverty threshold. Hourly wage is not a very precise predictor of family income status.

Joseph Sabia (Sabia 2014a, table 2) makes the same point and shows how dramatically the poverty status of low-wage workers has changed over time.²⁵ In 1959, 42 percent of low-wage workers were in

²⁴ The CBO estimates that, in addition to the 16.5 million workers whose wages are below the new minimum, another 8 million workers would be in this “ripple” range, between \$10.10 and \$11.50/hour, but the CBO “did not have a basis for estimating the total number of (these “ripple”) workers whose earnings would rise.” (CBO 2014, p. 21) To the extent that any of workers received a raise, the ratio of workers better off: workers worse off would rise above the over 30:1 estimated above.

²⁵ In this article, Sabia (Sabia 2014a, p. 1031) defines low-wage workers as those “earning less than half of the average private sector wage (\$9.87 in 2012) and working at least 15 hours per week and at least 14 weeks in the last year...” With a different definition of ‘low wage’, Sabia’s quantitative results differ from those of the Congressional Budget Office (CBO 2014), but the qualitative results are the same. Sabia extends the work of Burkhauser and Finegan (Burkhauser and Finegan 1989), who were among the first to point out the declining proportion of low-wage workers who were in poor families. Studying the

poor families, and 74 percent were in families below 2 times the poverty line. Thirty years later, these numbers had declined to 22 and 51, and by 2012, only 13 percent of low-wage workers were in poor families, and only 40 percent in families below twice the poverty line. A policy tool that was once well targeted, when many families had one primary earner, has become considerably less so over time.

Overall, counting just those moving out of poverty (or moving into poverty, because of job losses caused by the higher minimum wage), the CBO estimates that about 900,000 fewer people would be in poor families following an increase in the minimum wage to \$10.10 per hour, a reduction of about 2 percent of a pool of about 45 million poor (CBO 2014, p. 11)²⁶. This number is modest because many low-wage earners are not in poor households, as noted above, and because some of those who are may remain poor even after the wage increase. On the other hand, counting as a success only those who cross a poverty line is a very narrow and restrictive criterion. Those who earn more under a higher minimum wage but whose families remain poor are still better off than they were before, as are those already above but near the poverty line who move further away from it. Certainly those within two times the poverty threshold are not well off and gains to them will reduce income inequality.

In contrast, the EITC is very well-targeted toward the low end of the income distribution since eligibility depends on family income, not individual earnings. A low-wage worker in a wealthy family would not be eligible for this credit. The EITC also *increases* employment rather than decreasing it, as the minimum wage does, even if only to a modest degree. The Center on Budget and Policy Priorities (CBPP 2016c) estimates that the EITC, in conjunction with the smaller related Child Tax Credit, lifted over 9 million persons out of poverty in 2013 (about 10 times the estimate for the \$10.10 per hour minimum wage) and made another 22 million persons less poor (Figure 7).²⁷

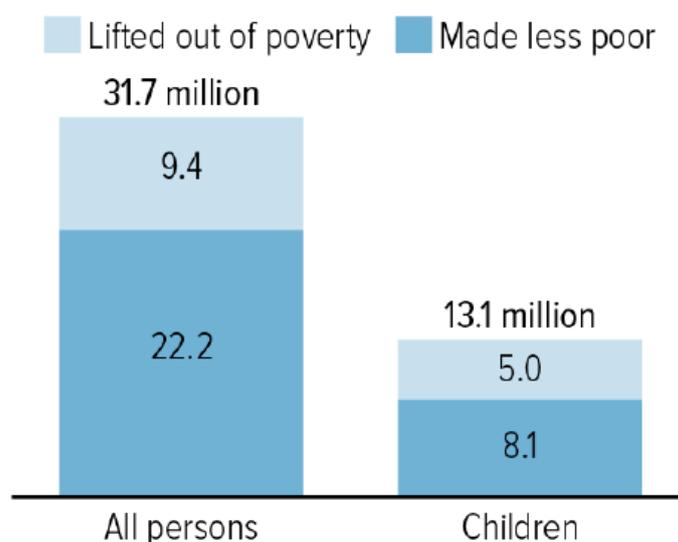


Figure 7. Millions of persons lifted out of poverty or made less poor (using supplemental poverty measure), by Earned Income Tax Credit and Child Tax Credit, 2013. See (CBPP 2016c).

relationship through 1985, Burkhauser and Finegan (Burkhauser and Finegan 1989, p. 65) conclude that “Economists...have mostly ignored the dramatic decline in the target efficiency of minimum-wage legislation...The overwhelming majority of low-wage workers are not poor; over half of the full-time working poor are not helped by the minimum wage; and most of the nonworking poor are hurt by its inflationary side effects.”

²⁶ These official poverty rates count only gross cash income, and exclude taxes (an important deficiency at the upper end of the income distribution) and tax credits (like the EITC, much more important at the lower end) as well as non-cash government benefits like Medicaid, housing assistance and the Supplemental Nutrition Assistance Program.

²⁷ The Child Tax Credit provides an additional 15% earning supplement, but only after the first \$3000 in earnings, to a maximum of \$1,000 per eligible child under age 17 (CBPP 2016a). For more detail on the Child Tax Credit and the Earned Income Tax Credit, see (CBO 2013).

Over 30 million people had their finances improved, although these head counts do not reveal by how much. A low-income couple without children could be included in these statistics, even though the average EITC amount for those without children is about \$6 per week, which could hardly make a big difference. Nonetheless, the EITC does a better job than the minimum wage at reducing economic distress at the lower end of the income distribution. And, as Richard Burkhauser ([Burkhauser 2015](#), p. 6) points out, for a given change in the well-being of poor families, “(T)he cost of a higher minimum wage to employers (and to consumers who purchase their products) was much larger than the cost to the government (and the taxpayers who provide these revenues) of an enhancement of the earned income tax credit.”

4. Some Other Aspects of the Minimum Wage and the EITC

Research suggests that the EITC not only encourages work and raises the income of poor and near-poor families, but also has other positive effects throughout the life cycle. There is evidence that the financial subsidy to workers improves maternal and infant health, reduces the number of low birth-weight infants, and leads to improved educational performance among youth in low-income households, including higher academic test scores, higher high school graduation rates and higher college attendance rates ([Marr et al. 2015](#); [Hoynes 2014](#)). Higher earnings will lead to higher Social Security benefits later. (Since these positive results stem from the additional income, not the EITC per se, a higher minimum wage would likely have similar effects among those still employed.) The EITC also acts as a temporary safety net during times of financial stress; e.g., following the loss of a spouse’s job or the birth of a child. In fact, as seen in [Figure 8](#), a majority of families utilize the EITC for only one (42%) or two years (19%) at a time; only 20 percent remain on the program for five or more consecutive years ([Marr et al. 2015](#)). Hilary Hoynes ([Hoynes 2014](#)) suggests that the EITC “may ultimately be judged one of the most successful labor market innovations in U.S. history.”

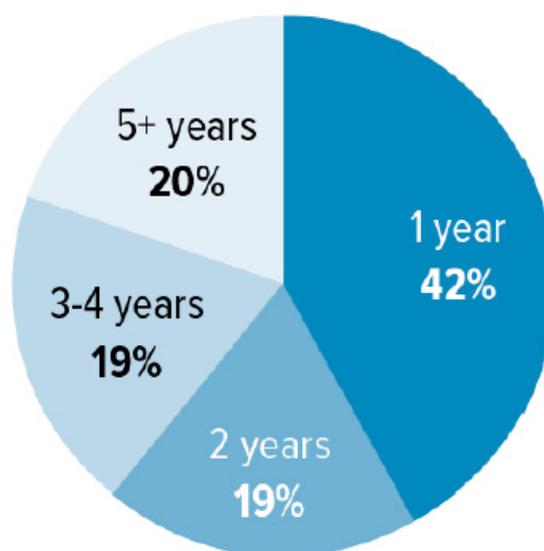


Figure 8. Share of Earned Income Tax Credit families by consecutive years with EITC. See ([Marr et al. 2015](#)).

The minimum wage likewise has impacts beyond its direct effects on the incomes of households with low-wage workers. Jared Bernstein and Heidi Shierholz ([Bernstein and Shierholz 2014](#)) argue that minimum wage legislation creates an important labor standard, reflecting a societal determination of “what’s right,” just like “laws against child labor, unpaid overtime for covered workers, (and)

discrimination...” all of which intervene in and override the natural equilibrium conditions of competitive labor markets and raise the costs of employers.²⁸

Bernstein and Shierholz (Bernstein and Shierholz 2014, p. 1039) are also supporters of the EITC, but point out that with a \$7.25/hour minimum wage, the EITC alone would leave the cash income of a solo worker with a family of four well (−17%) below the poverty line, whereas the same EITC rules would put them slightly (5%) above the poverty threshold with a minimum wage of \$10.10/hour. They also note that the EITC is a once-per-year tax refund, far from ideal for a family living near the edge, compared to the benefits of an increased minimum wage which appear in each paycheck. Also, since the minimum wage is not means-tested, recipients do not have to submit documentation to meet income or asset standards in order to qualify.

Finally, as a participant in a recent conference on issues of inequality hypothesized, the same financial outcome may provide different levels of satisfaction depending on the source of the income. Many individuals prefer to work than to be on the dole, given the many positive non-pecuniary social aspects of employment, and similarly, a wage paid by an employer, reflecting what that employer deems that employee to be worth, may feel better to the worker than a lower wage, supplemented by a government income redistribution policy like the EITC, even if the net wages are the same. These subtleties go beyond the simplest of economics models, in which leisure is a good and work, therefore, a bad. The conference participant noted that there have been many public rallies in favor of increasing the minimum wage, but few if any advocating for a higher EITC, even if the latter is the more effective social policy.

5. Conclusions

The minimum wage and the Earned Income Tax Credit both have advantages and disadvantages. The minimum wage shows up in every weekly, bi-weekly and monthly paycheck of the workers affected. It is funded by employers, and results in job losses to workers who would have been hired at a lower wage but are not hired at the higher minimum wage. The good news is that in recent examples of minimum wage increases many more workers remained employed at the higher wage than were laid off, but the impact of a job loss to an individual is probably much larger than the benefit to another who remained employed. And it is not clear how well past experiences with modest changes in the minimum wage will predict the impacts of the much larger increases being contemplated and legislated today. A drawback of minimum wage policy is that many of those better off after a minimum wage increase are not in poor or even near-poor families, but rather in families with earnings and other income sources that place them far above the poverty threshold. These are not workers for whom the minimum wage was designed. This phenomenon has grown over time, as the average number of workers per family has grown, and as the instances in which a minimum wage worker is a family's only or even primary worker has decreased (Burkhauser 2015, p. 9).

The Earned Income Tax Credit is a once-per-year refund (not ideal timing for a poor family) and requires recipients to file income tax forms, which the vast majority of those eligible for the EITC do. It is very well targeted towards the poor and near-poor because eligibility depends on family income, not individual wage rates, and it is financed by taxpayers, not by employers.²⁹ In fact, employers may find that the wages rates they pay decline and that they are able to capture some of the government transfers designed to assist workers. As the wage that employers pay declines and the wage received

²⁸ Frances Perkins, the Secretary of Labor when the original minimum wage was legislated, described the goal of the Fair Labor Standards Act as the “elimination of labor conditions detrimental to the maintenance of the minimum standards of living necessary for health, efficiency and well-being of workers” (Bernstein and Shierholz 2014, p. 1038). A minimum wage was only one such mechanism.

²⁹ See footnote 21. Although the EITC is an expensive program, costing the federal government nearly \$70 billion in 2014, some of the cost is recouped by the governments (federal and the states that supplement it) by additional tax revenues from the economic activity associated with the additional employment.

by workers rises, employment will increase rather than decline, which is a major advantage of the EITC.³⁰

Fortunately, these policies are not mutually exclusive, and in the United States, policy-makers have chosen to utilize both—the EITC because it encourages work, raises both wage rates and employment, is well targeted toward workers in low-income families, and because its costs are shared widely; and the minimum wage because it shows up in each paycheck, helps many more than it hurts and does not significantly affect the federal budget.³¹ Both policies should result in reduced reliance on government welfare policies. Both may also reduce employee turnover, reducing hiring and training costs for employers, and both policies should reduce income inequality, an important goal for many.

The EITC and the minimum wage interact in interesting ways. An increase in the minimum wage directly increases the earnings in families in which workers are not laid off, which in turn increases the EITC for those on the (rising) subsidy side of the graph in Figure 4. They gain twice. For those who are on and remain on the flat part, their EITC amount is unaffected. But for those on the downward sloping phase-out side, the minimum wage gains would be partially offset by the reduction in EITC benefits, discouraging work at the margin (CBO 2014, p. 15)

The best policy is not one or the other but both. They are complements not substitutes, as Bernstein and Shierholz (Bernstein and Shierholz 2014, p. 1038) argue, noting that relying on just the EITC to get the outcome generated by both would impose a much higher and perhaps unacceptable financial burden on taxpayers. If only one were allowed, and the primary goal were to improve the financial well-being of workers near the bottom on the income distribution, the EITC would dominate, although neither it nor the minimum wage helps those who do not or cannot work. But each has its advantages, some economic and some symbolic, and we expect policymakers in the United States to continue to use both in the future.

Author Contributions: Joseph F. Quinn and Kevin E. Cahill conceived the idea for this paper, researched the literature and wrote the paper.

Conflicts of Interest: The authors declare no conflict of interest.

References

- History of minimum wage. *BeBusinessed.com*. Available online: <http://bebusinessed.com/history/history-of-minimum-wage> (accessed on 13 April 2017).
- Belman, Dale, and Paul Wolfson. 2014. *What Does the Minimum Wage Do?* Kalamazoo: Upjohn Institute Press.
- Bernstein, Jared, and Heidi Shierholz. 2014. The minimum wage: A crucial labor standard that is well targeted to low and moderate-income households. *Journal of Policy Analysis and Management* 33: 1036–43. [CrossRef]
- Bradley, David. 2015. *The Federal Minimum Wage: in Brief*. Washington: Congressional Research Service.
- Burkhauser, Richard. 2015. *The Minimum Wage versus the Earned Income Tax Credit for Reducing Poverty*. Bonn: IZA World of Labor.
- Burkhauser, Richard, and T. Aldrich Finegan. 1989. The minimum wage and the poor: The end of a relationship. *Journal of Policy Analysis and Management* 8: 53–71. [CrossRef]

³⁰ It is interesting to note that, despite this major advantage of the EITC, only the U.S., the U.K. (in 1999) and Canada (a small program in 2007) have adopted some version of the EITC, whereas many countries, including almost all European countries, have minimum wage legislation (Burkhauser 2015, pp. 2, 5, 7).

³¹ An increase in the minimum wage would have several offsetting effects on the federal deficit. The deficit will tend to rise as the federal government pays higher wages to a small number of low-paid hourly employees, pays more for some goods and services whose prices rise, receives less tax revenue from businesses whose profits decline, and makes additional transfer payments to workers laid off. But at the same time, the deficit will decline as the government receives more tax revenues from minimum and near-minimum wage workers who now earn more, and as the government pays less in transfer payments to those same workers still employed and enjoying higher incomes. The CBO (CBO 2014, p 14) concludes that “it is unclear whether the effect for the coming decade as a whole would be a small increase of a small decrease in budget deficits.”

- CBPP (Center on Budget, Policy Priorities). 2016a. Policy basics: the Child Tax Credit. Available online: <http://www.cbpp.org/research/policy-basics-the-child-tax-credit> (accessed on 13 April 2017).
- CBPP (Center on Budget, Policy Priorities). 2016b. Chart Book: the Earned Income Tax Credit and Child Tax Credit. Available online: <http://www.cbpp.org/sites/default/files/atoms/files/1-7-15tax-chartbook.pdf> (accessed on 13 April 2017).
- CBPP (Center on Budget, Policy Priorities). 2016c. Policy basics: the Earned Income Tax Credit. Available online: <http://www.cbpp.org/research/federal-tax/policy-basics-the-earned-income-tax-credit> (accessed on 13 April 2017).
- CBPP (Center on Budget, Policy Priorities). 2016d. Policy basics: State Earned Income Tax Credits. Available online: <http://www.cbpp.org/research/state-budget-and-tax/policy-basics-state-earned-income-tax-credits> (accessed on 13 April 2017).
- CBO (Congressional Budget Office). 2013. *Refundable Tax Credits*. Washington: U. S. Government Printing Office.
- CBO (Congressional Budget Office). 2014. *The Effects of a Minimum-wage Increase on Employment and Family Income*. Washington: U. S. Government Printing Office.
- Clemens, Jeffrey, and Michael Wither. 2014. The Minimum Wage and the Great Recession: Evidence on the Effects on the Employment and Income Trajectory of Low-skilled Workers. Working Paper 20724, National Bureau of Economic Research, Cambridge, MA, USA. Available online: <http://www.nber.org/papers/w20724> (accessed on 13 April 2017).
- Cooper, Daniel H., Byron F. Lutz, and Michael G. Palumbo. 2011. *Quantifying the Role of Federal and State Taxes in Mitigating Income Inequality*. Public Policy Discussion Papers No. 11-7, Federal Reserve Bank of Boston, Boston, MA, USA.
- Cooper, David, and Douglas Hall. 2013. *Raising the Federal Minimum Wage to \$10.10 Would Give Working Families, and the overall Economy, a Much-Needed Boost*. Briefing Paper #357, Economic Policy Institute, Washington, DC, USA.
- The 2016 Democratic Platform. 2016. Available online: <https://www.democrats.org/party-platform> (accessed on 13 April 2017).
- Economic Policy Institute. 2016. Minimum Wage Tracker. Available online: <http://www.epi.org/minimum-wage-tracker/> (accessed on 13 April 2017).
- Glaeser, Edward. 2012. Cash Better Than Food Stamps in Helping Poor: Glaeser. *Bloomberg View*, February 27. Available online: <https://www.bloomberg.com/view/articles/2012-02-28/cash-better-than-food-stamps-in-helping-poor-commentary-by-edward-glaeser> (accessed on 13 April 2017).
- Grossman, Jonathan. 1978. Fair Labor Standards Act of 1938: Maximum struggle for minimum wage. *Monthly Labor Review* 101: 22–30. [PubMed]
- Giulietti, Corrado. 2015. Do minimum wages induce immigration? *IZA World of Labor*. Available online: <http://wol.iza.org/articles/do-minimum-wages-induce-immigration> (accessed on 13 April 2017).
- Holtz-Eakin, Douglas, and Ben Gitis. 2015. *Counterproductive: The Employment and Income Effects of Raising America's Minimum Wage to \$12 and to \$15 per Hour*. Issue Brief No. 36, Manhattan Institute for Policy Research, American Action Forum, New York, NY, USA. Available online: <http://americanactionforum.aaf.rededge.com/uploads/files/research/Counterproductive.pdf> (accessed on 13 April 2017).
- Hoynes, Hilary W. 2014. A revolution on poverty policy: The Earned Income Tax Credit and the well-being of American families. Available online: https://web.stanford.edu/group/scspi/_media/pdf/pathways/summer_2014/Pathways_Summer_2014_Hoynes.pdf (accessed on 13 April 2017).
- IRS (Internal Revenue Service). 2016a. 2015 EITC income limits, maximum credit amounts and tax law updates. Available online: <https://www.irs.gov/credits-deductions/individuals/earned-income-tax-credit/eitc-income-limits-maximum-credit-amounts> (accessed on 13 April 2017).
- IRS (Internal Revenue Service). 2016b. About EITC. Available online: <https://www.eitc.irs.gov/EITC-Central/abouteitc> (accessed on 13 April 2017).
- Kaiser Family Foundation. 2015. The facts on Medicare spending and financing. (Fact Sheet). Available online: <http://kff.org/medicare/fact-sheet/medicare-spending-and-financing-fact-sheet/> (accessed on 13 April 2017).
- Kurtz, Annalyn, and Tal Yellin. 2016. Minimum wage since 1938. *CNN Money*. Available online: <http://money.cnn.com/interactive/economy/minimum-wage-since-1938/> (accessed on 13 April 2017).

- Lazo, Alejandro, and Erica Orden. 2016. California, New York governors sign minimum wage increase into law. *The Wall Street Journal*, April 4. Available online: <https://www.wsj.com/articles/california-new-york-governors-sign-minimum-wage-increase-into-law-1459794036> (accessed on 13 April 2017).
- Mankiw, Greg. 2008. Four goals of tax policy. *Greg Mankiw's Blog*, January 31. Available online: <http://gregmankiw.blogspot.com/2008/01/four-goals-of-tax-policy.html> (accessed on 13 April 2017).
- Marr, Chuck, Chye-Ching Huang, Arloc Sherman, and Brandon Debot. 2015. EITC and Child Tax Credit promote work, reduce poverty, and support children's development, research finds. *Center on Budget and Policy Priorities*, October 1. Available online: <http://www.cbpp.org/research/federal-tax/eitc-and-child-tax-credit-promote-work-reduce-poverty-and-support-childrens> (accessed on 13 April 2017).
- Meer, Jonathan, and Jeremy West. 2016. Effects of the minimum wage on employment dynamics. *Journal of Human Resources* 51: 500–22. [CrossRef]
- National Employment Law Project. 2016. What's the minimum wage in your state? Available online: <http://www.raisetheminimumwage.com/pages/minimum-wage-state> (accessed on 13 April 2017).
- Neumark, David. 2015. The evidence is piling up that higher minimum wages kill jobs. *The Wall Street Journal*, December 15. Available online: <https://www.wsj.com/articles/the-evidence-is-piling-up-that-higher-minimum-wages-kill-jobs-1450220824> (accessed on 13 April 2017).
- Neumark, David, and William Wascher. 2008. *Minimum Wages*. Cambridge: MIT University Press.
- Nicholas, Peter. 2016. Democrats add Bernie Sanders's \$15 minimum wage call to party platform. *The Wall Street Journal*, July 9. Available online: <https://blogs.wsj.com/washwire/2016/07/09/democrats-add-bernie-sanders-15-minimum-wage-call-to-party-platform/> (accessed on 13 April 2017).
- Purcell, Patrick J. 2015. *Income Taxes on Social Security Benefits*; Issue Paper No. 2015-02, US Social Security Administration, Washington, DC, USA. Available online: <https://www.ssa.gov/policy/docs/issuepapers/ip2015-02.pdf> (accessed on 13 April 2017).
- Rothstein, Jesse. 2010. Is the EITC as good as an NIT? Conditional cash transfers and tax incidence. *American Economic Journal: Economic Policy* 2: 177–208. [CrossRef]
- Sabia, Joseph J. 2014a. Minimum wages: An antiquated and ineffective policy tool. *Journal of Policy Analysis and Management* 33: 1028–36. [CrossRef]
- Sabia, Joseph J. 2014b. The minimum wage: No feature, all bugs. *Journal of Policy Analysis and Management* 33: 1043–46. [CrossRef]
- Tax Policy Center. 2015. Model estimates: T15-0138—Tax units with zero or negative income tax. Available online: <http://www.taxpolicycenter.org/model-estimates/tax-units-zero-or-negative-income-tax/tax-units-zero-or-negative-income-tax> (accessed on 13 April 2017).
- The Initiative on Global Markets. 2015. *IGM Forum: \$15 Minimum Wage*. Chicago: The University of Chicago Booth School of Business. Available online: <http://www.igmchicago.org/surveys/15-minimum-wage> (accessed on 13 April 2017).

