



MINIMUM WAGE, MAXIMUM BENEFIT

How a \$10 Wage Floor Impacts All Workers and the Economy



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Research Report

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Executive Summary

The Impact of Raising Illinois' Minimum Wage to \$10.00:

A 21.2-percent minimum wage hike in Illinois would:

- Increase labor income by \$1.9 to \$2.3 billion for intended beneficiaries and by \$5.4 to \$7.2 billion for all workers;
- Cause either a small drop or small gain in employment (between -70,000 and 32,000 jobs);
- Have no impact or a small impact on weekly hours worked (between -0.7 and 0.0 hours per worker);
- Generate \$141.2 to \$192.2 million in new annual state income tax revenue; and
- Further raise total labor income by up to \$414.2 million annually if sub-minimum wage workers are actually paid the new minimum wage, increasing ten-year tax revenues by another \$63.0 million for Illinois' state and local governments and \$89.2 million for the federal government.

Policy Implications and Recommendations:

The Fair Labor Standards Act should be expanded to cover more workers.

In Illinois, the minimum wage should be:

- Expanded to cover employers with 2 or more employees;
- Raised to \$10.00 per hour;
- Indexed to the chained-Consumer Price Index,
- Set at \$1.00 below the new adult rate for workers under 18 years old;
- Paired with an expansion of the state's Earned Income Tax Credit; and
- Apply in the first 90 days of employment.

On the enforcement side:

- Punitive damages for not paying the minimum wage should be increased;
- The number of minimum wage investigators in Illinois should be doubled; and
- Unionization should be promoted and worker center collaborations expanded to reduce minimum wage theft.

While there has recently been much public debate on the merits of raising the minimum wage, this report finds a substantial simulative impact of the increase on average wages and at worst a small negative effect or at best a minimal positive impact on employment. Ultimately, a minimum wage increase would reduce income inequality, increase consumer demand, and grow the Illinois economy.

Introduction

Five years into the recovery from the Great Recession, economic conditions in the United States remain precarious. While improvements in several economic metrics have signaled a strong recovery, they have masked the struggles that ordinary Americans continue to face in a relatively weak labor market. In October 2013, the nation's gross domestic product (GDP) was \$843.2 billion higher than it was in December 2007, after adjusting for inflation (BEA, 2014). The S&P 500 stock market index rebounded by 29.7 percent from January 1, 2007 to January 1, 2014 (Yahoo, 2014). Additionally, the number of Americans seeking unemployment benefits has returned to pre-recession levels (CBS, 2013). Meanwhile, other important indicators of the economy's health lag behind. At 6.7 percent, the national unemployment rate still exceeds the pre-recession level of 5.0 percent (BLS, 2014). Wages, after adjusting for inflation, have been stagnant or have even declined for many workers (Mishel & Shierholz, 2013). While the average real wage has slightly increased, a disproportionate share of the gains has been captured by the richest Americans (Saez, 2013).

Indeed, income inequality in America has increased to levels not seen at any time since the late 1920s. Changes in the global economy, political changes, deregulation and new business strategies, and adjustments in labor market policies have all contributed to the growth in inequality. While income inequality has risen for almost all developed economies over the past few decades, the United States has seen the largest increase among advanced nations (Weeks, 2005). This growing income disparity has caused President Barack Obama to make income inequality, which he has called the "defining challenge of our time," a top priority for his administration in 2014 (U.S. News, 2014).

One proposed policy change to increase demand in the economy and address rising inequality is to raise the federal minimum wage, currently at \$7.25 per hour. In January 2014, six-hundred economists— including seven Nobel laureates— signed a statement urging the President and U.S. Congress to raise the federal minimum wage to \$10.10 per hour by 2016, mirroring legislation introduced early in 2013 by Senator Tom Harkin and Representative George Miller. The hike, the economists argue, would "provide a much-needed boost to the earnings of low-wage workers" (EPI, 2014). President Barack Obama, who previously advocated raising the federal minimum wage to \$9.00 per hour, has also gotten behind the proposed increase to \$10.10 (State of the Union Address, 2014).

More than two-thirds of the American population believes the minimum wage should be raised. From November 2013 to January 2014, seven polls surveying a total of 9,779 adults and registered voters nationwide found that between 66 percent and 76 percent of Americans support a hike in the federal minimum wage. A minimum wage increase also has bipartisan backing among registered voters. An overwhelming 91 percent of Democrats and 67 percent of independents support a wage increase, as do a plurality of Republicans (49 percent in favor compared to 44 percent opposed). On average, survey respondents say that the minimum wage should be \$9.41 an hour (Polling Report, 2014).

In Illinois, where the minimum wage is presently above the federal level at \$8.25 per hour, Governor Pat Quinn has pushed for a 21.21 percent increase to \$10.00 per hour. To boost the economy, alleviate poverty, and reduce crime, Governor Quinn contends that over a half-million Illinois consumers "will make an extra \$4,800 a year, income which can be spent at local businesses." (ABC7, 2013). Business executives and Republican leaders in the state, however, have decried the proposed increase, saying that it will kill jobs and hurt Illinois' economic competitiveness.

The impact that the minimum wage does or does not have on employment is important, but should not be the only concern. Whether employees actually fully take home the legislated increase is also significant. Unfortunately, the polarization of worker incomes has also been characterized by a significant incidence of wage theft among workers at the bottom. For numerous reasons, millions of working Americans are not getting paid the total amount that they are owed by law. A primary way in which unscrupulous employers steal wages is by not paying the minimum wage to their workers, and violation rates are common in low-wage industries (Bobo, 2009). When undeterred, minimum wage theft contributes to growing wage inequality in America.

This joint Research Report by the Illinois Economic Policy Institute and the University of Illinois Labor Education Program analyzes the impact that raising the minimum wage has on employment measures and worker earnings from hourly wages.

The Research Report is broken up into seven sections. The first section evaluates the minimum wage through the lenses of both economic theory and a thorough literature review. The second summarizes extant research on wage theft, specifically investigating how and why employers do not pay the full minimum wage. The next section details the methodology of the report. Sections four and five outline the main findings by analyzing the effect that minimum wage increases have on the wages of all workers and on employment. Estimates are then incorporated into models in section six to demonstrate both how the economy would be different if those earning sub-minimum wages were actually paid the current rate and how a minimum wage hike to \$10.00 would impact the Illinois economy. Subsequently, in the seventh section, the report transitions into a discussion of data-driven policy recommendations. The Research Report concludes with a recap of key findings.

1. The Minimum Wage: Theory and Realities

According to classical economic theory, a minimum wage causes inefficiency and raises unemployment. By establishing a lower bound on the amount that any worker must be paid, the minimum wage acts as a “wage floor.” As long as the floor is set above the equilibrium wage where supply meets demand, theory predicts that more workers will be willing to work low-wage jobs and that some potential jobs which would have been offered by employers at the equilibrium level will go unfilled. The increase in potential workers and decrease in jobs offered imply that the policy causes a surplus of workers competing for available jobs; without allowing competition to put downward pressure on the wage so that it falls below the floor, unemployment rises.

Economic logic, though often insightful, relies on a set of assumptions about minimum wage’s impact that are unlikely to hold in reality. Three assumptions in particular are worth addressing: perfectly competitive markets, perfect information, and homogeneous workers. First, markets are not perfectly competitive. Not only do various government policies such as taxes and regulations interfere with market processes, but natural monopolies, monopsonies, and private cartels would (and do) operate if government fails to act. While perfect competition is a reasonable supposition in some markets, it is certainly not universal in the entire economy.

Second, economic theory assumes that all market actors— in this case, firms and workers— have equivalent information. But this is rarely if ever true. Companies generally have more and better information about their product, labor needs, and consumers than a potential hire while workers generally have more and better information about their skills, abilities, and work ethic than potential employers do. This information asymmetry creates a power imbalance in the market, and can lead to economically inefficient outcomes. Finally, the simple supply-and-demand framework assumes that all workers are exactly the same by “holding all else constant.” While this practice is largely effective, it may be unreliable as a basis of expected policy impacts in a dynamic economy

where workers come from diverse backgrounds in terms of race, ethnicity, gender, age, education, work ethic, family life, and income levels.

Research on the impact that the minimum wage has on employment over time has reached fairly conclusive findings. In 1981, two economists from Brown University and the Federal Reserve found that, contrary to economic theory, minimum-wage policy had no impact on national employment or on average wages (Borschen & Grossman, 1981). However, the researchers did find that minimum wages do affect the composition of the workforce, noting that employment decreased for some low-wage industries, for teenagers, and for young men but that it increased for adults and young women. For firms in the fast-food industry that were forced to increase pay to satisfy an elevated minimum wage in the early 1990s, 73 percent reported that they did not have to cut employees, shifts, or fringe benefits, and there was no evidence that they passed on higher labor costs to consumers through higher prices (Katz & Krueger, 1991; Katz & Krueger, 1992).

This minimal impact on the fast-food industry, a sector that disproportionately employs workers at or around the minimum wage level, was corroborated in a landmark 1994 study (Card & Krueger, 1994). Card and Krueger, two prominent labor economists, surveyed fast-food establishments in New Jersey and bordering Pennsylvania counties both before and after the minimum wage was increased in New Jersey and found that the increase had no statistically significant disemployment effect. In fact, there was evidence that the minimum wage hike increased demand in the economy and created between 2 and 3 full-time equivalent jobs per establishment (Card & Krueger, 1994). This paper later came under criticism, however, since the New Jersey economy was growing faster before the policy change than the Pennsylvania counties used as a comparison, and since the data was based on a survey of establishment owners and managers rather than on payroll data (Neumark & Wascher, 1995). In response to the pushback, Card and Krueger re-evaluated the policy's impact using new payroll and survey data and once again found no negative effect on employment (Card & Krueger, 1998).



Various studies from the late 1990s through the middle 2000s tended to challenge Card and Krueger's findings by estimating negative impacts on teenagers, nonwhites, and lesser-skilled workers. A 10 percent increase in the minimum wage was found to reduce the employment of 16 to 24 year olds by between 1 and 2 percent (Neumark, 1999), to reduce the earnings of minority men (Neumark & Wascher, 2007), and to lower the earned income of nonunion workers (Neumark et al., 2000). Additionally, it was contended that exposure to higher minimum wages had negative long-term effects on workers even as they reach their late 20s: those who lived in areas with higher minimum wages, especially as teenagers, worked less on average the longer they were exposed to the higher wage (Neumark & Nizalova, 2004). An analysis of 1,474 estimated minimum wage employment impacts in 64 academic studies between 1972 and 2007 found that a 10 percent increase would reduce the employment level by between 0.5 and 1.9 percent on average. Among the estimates which the authors of the 64 studies specified as their preferred, best, or most precise assessments, however, there was no statistically significant impact on employment (Doucouliagos & Stanley, 2009).

Recent research utilizes innovative statistical approaches and finds no significant impact on employment. One problem facing researchers is that states do not randomly choose whether to raise their minimum wage. States that had greater reductions in routine-task occupations, higher wage inequality between the richest workers and the

middle class, and had sharper economic contractions during recessions were more likely to raise the minimum wage (Allegretto et al., 2013). These economic and industry trends need to be accounted for in order to parse out the true causal effect of the minimum wage increase. Labor economists Dube, Lester, and Reich use a contiguous border-county pairs approach to address this matter. This strategy combines the local case studies approach (e.g., Card & Krueger, 1994) with the time series approach (e.g., Borschen & Grossman, 1981). Since “the counties border each other, differences due to geographic and locational factors should be minimized” and since the county economies are likely to be interconnected, the minimum wage disparities are one of the only differences from one county to its neighbor across the border (Dube et al., 2010).

In analyzing 1,169 border-county pairs from 2001 to 2008, Dube, Lester, and Reich find that the minimum wage is generally a positive labor market institution for workers. They estimate that a 10 percent increase in the minimum wage raises the average earnings of teenagers by 1.6 percent and reduces employment by a small 0.4 percent. The minimum wage increase raises the earnings of restaurant workers even more, by 2.1 percent on average, and lowers the restaurant job level by 0.6 percent (Dube et al., 2011). Beyond the restaurant industry, a 10 percent hike increases the earnings of workers in the aggregate accommodation-food-retail sector by 0.8 percent but had no statistically significant impact on the sector’s total employment. Manufacturing, meanwhile, experiences no earnings or employment effects (Dube et al., 2010). A comparable study for the restaurant-and-bar sector in the United Kingdom also found no evidence that increasing the minimum wage reduced employment once long-term sectoral trends were accounted for (Addison et al., 2012). Accordingly, since 2000, the accumulation of studies suggests that a 10 percent increase in the minimum wage reduces employment by a scant -0.6 or -0.7 percent (Wolfson & Belman, 2013).

There are many explanations for why the minimum wage appears to have little to no discernible effect on total employment. One explanation is simply that the negative impact takes time to materialize. One paper finds no evidence of job destruction or a negative employment effect but estimates that a 10 percent increase in the minimum wage reduces job *growth* in a state by 0.5 percentage points. Over time, some researchers argue, the drop in job growth means that employment is lower than it otherwise would have been (Meer & West, 2013). But job growth is only one side of the story. In fact, while the number of new job hires declines, so too does the number of job *separations* through layoffs or quits (Dube et al., 2011). For teen workers and restaurant establishments, a 10 percent increase in the minimum wage reduces labor turnover by between 2.0 and 3.9 percent (Dube et al., 2013). These changes occur within the first nine months of a minimum wage increase and persist thereafter. Accordingly, minimum wage increases “substantially reduce turnover and increase job stability, even without affecting overall employment levels for highly affected groups.” (Dube et al., 2013). The higher “efficiency wage” encourages workers to work harder to keep their jobs, incentivizes employers to be diligent in their hiring practices, and lowers the costs of turnover.

Another explanation for the lack of a noticeable employment effect from an increase in the minimum wage is that the policy stimulates the economy through increased aggregate consumer demand. Research has demonstrated that the rich save more as a share of their incomes than the poor. A \$10,000 increase in income is associated with 1 to 7-percentage point increase in a household’s savings rate (Dyner et al., 2004). Similarly, consumption inequality mirrors income inequality: from 1980 to 2007, after-tax income inequality increased by 33 percent while consumption inequality grew by 17 to 28 percent (Aguar & Bils, 2011). But the 50-10 inequality ratio (i.e., the median worker’s wage compared to the bottom 10 percent of earners) is significantly impacted by the minimum wage. One study estimated that the declining real value of the minimum wage has contributed to between 35 and 45 percent of the rise in 50-10 inequality in America (Autor et al., 2010) while another estimated a 57 percent contribution (Mishel, 2013). Although declining unionization is the main cause of the increase in inequality for men, the loss in the value of the minimum wage is the main cause for female workers (Gordon & Dew-Decker, 2008; Mishel, 2013). Additionally, in the United Kingdom, a 10 percent minimum wage increase has been found

to reduce the gap between the highest 10 percent of earners and the lowest 10 percent of earners (the 90-10 ratio) by 2.9 percent (Dickens et al., 1994). Finally, a 10 percent increase in the U.S. minimum wage has been found to lower the poverty rate by between 2 and 3 percent; a 39 percent raise in the federal rate from \$7.25 to \$10.10 per hour would cause the federal poverty rate to drop from 17.5 percent to between 15.0 and 15.8 percent (Dube, 2013).

Since the minimum wage compresses wages and reduces extreme inequality, it can have a neutral or even positive effect on total consumer demand, eliminating potential job losses from the policy. In 2009, researchers at the Federal Reserve Bank of Chicago found that “spending increases substantially after a minimum wage hike” (Aaronson et al., 2009). For every dollar increase in the minimum wage, families with a minimum wage worker increase spending by \$744 to \$869 per year on average. There is also suggestive, but statistically insignificant, evidence that the minimum wage increase causes families without a minimum wage worker to increase spending as well (Aaronson et al., 2009). These results led another researcher to find that an increase in the federal minimum wage from \$7.25 to \$8.25 per hour would affect 5.11 million U.S. households and increase consumption by \$17.8 billion (Filion, 2009). Similarly, recent estimates suggest that raising the federal minimum wage to \$10.10 would increase the wages of 21.3 million workers directly and 9.0 million indirectly, increase labor income by \$51 billion, and create 140,000 net new jobs (Cooper & Hall, 2013). A binding minimum wage, therefore, “is desirable if the government values redistribution toward low wage workers and if unemployment hits the lowest surplus workers first” (Lee & Saez, 2008).



Another possible reason that economic research reveals no impact of a minimum wage increase on employment is because companies have other “channels of adjustment” (Schmitt, 2013). Other than eliminating jobs or cutting hours, employers may change the internal wage structure both by compressing wages of the highest paid and lowest paid and by slowing pay increases for higher-wage workers (Schmitt, 2013). Employers may also reduce customer service or accept lower profits. In the United Kingdom, for example, an increase in the national minimum wage was found to have no impact on employment or firms being forced out of business but a 5.4 to 13.9 percent increase in wages and a 3.1 to 4.2 percent decrease in profitability (Draca et al., 2008). Moreover, firms may pass on any higher labor costs to consumers through small price increases, causing inflation. The evidence that prices increase as a result of higher minimum wages, however, is weak (Katz & Krueger, 1992; Card & Krueger, 1994; Wadsworth, 2010).

Finally, the minimum wage has an unintended long-term benefit that may conceal the employment effect. A higher minimum wage may provide teenagers with the incentive to invest more in themselves by extending their schooling. Some employers, faced with an inability to hire workers below the wage floor, may substitute capital and new technologies for labor. This reduces employment, particularly among young workers. In response, teenagers drop out of the labor force, go back to school, and gain the education and skills necessary to raise their own productivity “to the level required to [re-]gain employment” under new economic circumstances (Sutch, 2010). As a result, the “educational cascade” adds 0.7 years of education to the average worker (Sutch, 2010). An increase in the minimum wage might raise the amount of “human capital” in the economy, an unexpected but beneficial long-run consequence of the policy.

2. The Problem of Minimum Wage Theft

While the minimum wage may not have a negative effect on the employment level, a lack of enforcement may have a deleterious impact. Unfortunately, wage theft is a pervasive problem in America, as millions of working Americans are not getting paid the full amount that they are owed (Bobo, 2009). A significant component of wage theft in America occurs in the form of minimum wage theft (i.e., employers not paying employees the legal minimum wage rate). In addition to minimum wage theft, employers (both knowingly and unintentionally) steal worker wages in a number of ways, including by making employees work off the clock, not paying the legal overtime rate, misclassifying workers, not paying a worker's final paycheck after a job separation, paying by-the-day or by-the-job, and by not paying unemployment insurance or worker's compensation.

There are many reasons why companies steal wages from their workers (Bobo, 2009). First, there could be information problems. Employers may not realize that their practices are depriving workers of income which they are owed or may be unaware that what they are doing is illegal. Employers may also misclassify workers as temporary or contingent laborers because they need to fill temporary needs and jobs gaps, and the arrangement may result in wage theft. Additionally, business practices that elevate short-term profits above long-term profitability and a "race to the bottom" for developed countries due to globalization both put downward pressure on wages. In response to these pressures, employers may look to save money at all costs. Improving employer practices so that jobs are designed around people and their education, skills, and preferences rather than solely around business strategy may enhance the prospects of low-wage workers (Lambert & Henly, 2007). Economically inefficient social issues such as racial, gender, and sexual orientation discrimination could also be at play.

The most plausible explanations for why wage theft occurs have to do with the relative power of firms and workers. With extensive unemployment, there are lots of people willing and able to take jobs, so employers do not feel pressure to improve wages and standards. Moreover, a significant number of undocumented workers allows employers to extract cheap labor from vulnerable individuals who want to work but are not fully protected under the law and face the threat of deportation if they push back on wage violations. Finally, the declining influence and resources of counterforces have made employers relatively more powerful today. Weak enforcement, decreases in Department of Labor funding, and trivial penalties for employers who break the law



mean that the disincentive to steal worker wages is waning. Declining labor union membership, however, is the primary reason that the deterrent effect is weakening. According to one researcher, unions remain "the best and most effective vehicle for stopping wage theft" because they train workers about their rights, protect workers who express concerns or have a grievance, protect job security, maintain relationships with community allies, provide attorneys to workers, and raise wages and benefits (Bobo, 2009).

The most prominent study on wage theft was conducted by researchers at the National Employment Law Project, the University of Illinois at Chicago, Cornell University, and the University of California, Los Angeles (Bernhardt et al., 2009). The study surveyed 4,387 "front-line" workers (i.e., not managers or professionals) who were at least 18 years old in low-wage industries in Chicago, Los Angeles, and New York City. Low wage industries were defined as having a median wage for front-line workers that was less than 85 percent of the median wage of the city. Among the many egregious findings, 26 percent of the low-wage worker sample were paid less than the

legally-required minimum wage, 30 percent of tipped workers were not paid the minimum wage, and 89 percent of “in-home” child care workers earned less than the minimum wage. A focus on those who were paid less than the minimum wage reveals that 60 percent (about 15 percent of the total sample) were paid less than the minimum rate by more than \$1 per hour. Overall, minimum wage violation rates were most common in apparel and textile manufacturing, private households, and personal and repair services but lower in construction, social assistance and education, and home health care. In sum, the researchers found that 1.1 million workers in Chicago, New York City, and Los Angeles alone experienced some form of pay-based violation, and lost more than \$2.9 billion per year as a result of employment and labor law violations (Bernhardt et al., 2009).

Additional research has also profiled many shocking minimum wage violations. In one case, a group of upscale food stores was ordered by a federal judge to pay \$1.5 million in minimum wage payments, overtime wage payments, and stolen customer tips to 550 workers who suffered the violations (Theodore, 2011). One turkey plant in Iowa was fined over \$1 million by the state and another \$1.7 million by the U.S. Department of Labor for more than 9,000 labor law violations, including failure to pay the minimum wage, pay stub violations, and making illegal deductions from paychecks (Gordon et al., 2012). Iowa workers also miss out on over \$500 million in wages each year due to wage theft, costing the state almost \$60 million in unpaid tax and state unemployment fund revenues (Gordon et al., 2012). Finally, in a survey of 57 car washes in the City of Chicago, researchers at the University of Illinois at Urbana-Champaign found that 75.6 percent of hand car wash workers earned below the state’s minimum wage and 13.0 percent earned below \$2 per hour. On average, workers in the occupation earned \$1.66 less than the state minimum wage per hour. Another 17.7 percent were also forced to pay a portion of their tips to the employer, only 10 percent were paid a defined hourly wage, and 66 percent were paid *only* in tips. In sum, surveyed workers lost \$4,413 annually by not being paid mandatory minimum wages and overtime rates (Bruno et al., 2012).

In an investigation into wage theft, nonprofit researchers found that the level of minimum wage enforcement is very small in America (Schiller & DeCarlo, 2010). Agencies of 43 states and the District of Columbia provided answers to a survey on the number of investigators employed to enforce minimum wage compliance. In the respondent localities, they found that there were 659.5 investigators tasked with enforcing the minimum wage, just one for every 146,000 private-sector workers. Florida had no state staff enforcing the minimum wage and some states such as Indiana and Iowa had only one investigator. Illinois had 13 investigators. In many cases, investigators were also cross-trained to enforce prevailing wage violations as well, limiting their time devoted to ensure minimum wage compliance. Disparities in the number of investigators result in different degrees of labor law compliance and in unlevelled playing fields where some unscrupulous employers have an illegal advantage over others (Schiller & DeCarlo, 2010).

3. Data and Methodology

This research report utilizes data from the Current Population Survey Outgoing Rotation Groups (CPS-ORG), which is collected, analyzed, and released by the U.S. Department of Labor Bureau of Labor Statistics (BLS). CPS-ORG data reports individual-level information on 25,000 respondents nationwide each month. The records include data on wages, unionization, hours, industry of employment, and occupation, as well as other demographic, geographic, education, and other work variables. The 10-year dataset from 2003 to 2012 captures information on 3,207,587 individuals aged 16 to 85 in the United States, including 1,730,969 observations of persons with a job. Analytic weights are provided by the BLS to match the sample to the actual total U.S. population 16 years of age or greater for each year. These weights adjust the influence of an individual respondent’s answers on a particular outcome to compensate for demographic groups that are either

underrepresented or overrepresented compared to the actual population. The weighted number of employed individuals over the 10-year sample was over 1.25 trillion. The data was extracted from the user-friendly Center for Economic and Policy Research Uniform Data Extracts and uses the preferred real wage variable which converts all worker incomes into uniform hourly wages and amends them to 2012 dollars using the CPI-U-RS inflation adjustment (Center for Economic and Policy Research, 2012).

The analysis conducted employs two statistical approaches which aim to account for unmeasured characteristics, parsing out the actual causal effect that higher minimum wages have— or do not have— on labor market outcomes. The primary empirical strategy used is an “ordinary least squares (OLS) regression model.” OLS regression models are run on average wages, hours worked, and a “wage theft” proxy variable (sub minimum wage earner share). For each labor market outcome, the analyses are run multiple times: first to provide a simple correlation; second to include demographic, work, sector of employment, and education characteristics; third to further incorporate 24 distinct occupation groups, 17 distinct industries, and yearly effects into a full model; and fourth to add in state-fixed effects. The regressions weigh the sample to match the overall U.S. population. In all analyses, the full model *without* state-fixed effects likely provides the best estimate— as that model controls for the most variables without including state variables which may bias the results because minimum wage rates do not change that much over time and because economic trends in states with high minimum wages and low minimum wages may not be the same (Allegretto et al., 2013).

The other strategy involves a “logistic regression model” to analyze the effect of a higher minimum wage on the probabilities that an individual is employed. This approach allows for estimates which predict that likelihood of a binary outcome (whether or not a person is employed or not due to an increase in the minimum wage). The reported results are average marginal effects (or average partial effects) which provide the average impact of a higher minimum wage rate for the entire sample. Logistic models do not allow for weights to be applied to the sample. Similar to the OLS regression strategy, this strategy is used multiple times, up to a full model with state fixed effects for completion. Again, the full model without state fixed effects likely provides the best estimate.

Limitations

There are limitations to the analysis. First, CPS-ORG data reports a worker’s state of residence rather than state of employment, so the results may be biased by workers who live in states with high minimum wages but work in states with a low minimum wage requirement (e.g., living in Illinois but working in Iowa) and vice-versa. Additionally, CPS-ORG data is based on household survey responses rather than on administrative payroll reports, so there is the potential that respondents were untruthful in their answers. Certain individuals such as undocumented workers are also likely to be underreported in the dataset because they may fear that taking the survey would expose them as undocumented and because they may be harder to reach by survey officials.

Finally, a proxy for wage theft is coded into the dataset for each worker. Each employed worker is assigned a 0 if he or she earned a nominal wage at or above the individual’s state minimum wage in the year he or she was surveyed, and a 1 if the individual earned less than the minimum wage. Given that many workers are excluded from being covered under minimum wage law (and the specifics vary even by state), this variable is not a one-for-one measure of minimum wage theft victims, but rather allows for a determination of the share of the workforce who earns less than the full, adult minimum wage in all states (i.e., “sub-minimum wage earners”). But a significant percentage of workers earning less than the adult minimum wage would still be problematic, indicating considerable minimum wage theft, high levels of minimum wage evasion by employers, and a notable share of workers who are not earning a minimal income commensurate with the cost of living.

4. Minimum Wage's Impact on Labor Market Outcomes

Descriptive Statistics of Those Earning At or Near the Minimum Wage

Table 1 provides a breakdown of employed workers in the American economy from 2003 to 2012, itemized by work, educational, and demographic characteristics. The statistics also include data on low-wage earners (LWEs), defined as those who earned \$10 or less per hour (in constant 2012 dollars). Over the 10-year period of analysis, there were 125.5 million employed persons annually in the U.S. labor market on average with 22.2 million (17.7 percent) of the American workforce earning \$10 or less per hour (Table 1).

Low-wage earners are different from the overall American workforce across many work characteristics. For the total employed population, the union membership rate was 12.2 percent and an additional 1.4 percent of workers were covered by a collective bargaining agreement but were not union members. By contrast, just 4.1 percent of low-wage earners were union members and 0.7 percent were covered nonmembers. Additionally, the average American worker had a usual workweek of 34.9 hours and 88.6 percent worked full-time (i.e., 35 or more hours per week). While low-wage earners worked 29.4 hours on average each week, a smaller majority (63.1 percent) worked full-time. Finally, a much larger share of low-wage earners (10.4 percent) worked part-time for economic reasons than the general workforce (4.5 percent), meaning that they wanted to work 35 hour or more but were part-time because they could not find a better job, their employer cut their hours, or there were seasonal declines in demand (Table 1).

Unsurprisingly, low-wage earners were less-educated than the larger American workforce. From 2003 to 2012, 39.4 percent of the American workforce had a high school degree equivalent or less and 31.5 percent had a bachelor's degree or more. For low-wage earners, by contrast, 62.3 percent had only a high school degree or no degree while 8.4 percent earned a bachelor's or advanced degree. Almost one-fifth (19.1 percent) of the low-wage workforce was a student either full-time (16.9 percent) or part-time (2.2 percent). Thus, 80.9 percent of those who earn \$10 per hour or less are not in school and are reliant on their low wage to pay for living expenses (Table 1).

The demographic comparisons between low-wage earners and the American workforce are striking. Even though women comprised 46.8 percent of the American workforce, 58.1 percent of those who earn \$10 or less per hour from 2003 to 2012 were female. African-American and Latino or Latina workers were also significantly over-represented in the low-wage labor pool, by 3.6 and 8.9 percentage points respectively, although the majority (57.5 percent) of low-wage earners were still white non-Latino workers. Low-wage earners were also less likely to be native-born, citizens, married, and veterans. Finally, the average age of the total employed population was 41.2 years old compared to 34.1 years old for those who earned \$10 or less per hour. Workers aged 16 to 24 were significantly overrepresented among the low-wage workforce, but three-fifths (60.5 percent) were at least 25 years old and two-fifths (40.8 percent) were at least 35 years old (Table 1).

Furthermore, Table 2 parallels the industry-of-employment differences between the total employed population and the low-wage workforce. By far, the sectors, which disproportionately paid workers an hourly wage of \$10 or less, were the food service, retail trade, and accommodation services industries. Together, these three industries employed 18.6 percent of all American workers but half of those who earn \$10 or less per hour. Meanwhile, the industries which employed the most workers at hourly rates above \$10 per hour as a share of total workers were the utilities, mining, public administration, financial and real estate, and construction industries. In addition, while 14.5 percent of the American workforce was employed in a public sector job, just 8.8 percent of low-wage earners worked for a federal, state, or local government agency (Table 2).

TABLE 1: CHARACTERISTICS OF LOW-WAGE EARNERS VS. TOTAL EMPLOYED POPULATION, 2003-2012

Variable	Low-Wage Earners (LWE)	Total Employed Population (TEP)	Difference (LWE-TEP)	Share (LWE/TEP)
Observations	292,072	1,730,969		0.169
Weighted N=	221,791,437	1,254,800,000		0.177
<i>Work Characteristics</i>				
Wage (2012 dollars)	\$8.17	\$21.90	-\$13.73	0.373
Union member	4.12%	12.15%	-8.03%	0.339
Covered by union	0.67%	1.43%	-0.76%	0.469
Usual hours worked	29.44	34.91	-5.470	0.843
Full-time (35 hours or more)	63.14%	88.61%	-25.47%	0.713
Part-time for economic reasons	10.42%	4.47%	5.95%	2.331
<i>Educational Characteristics</i>				
Less than high school	28.41%	10.59%	17.82%	2.683
High school	33.85%	28.82%	5.03%	1.175
Some college, no degree	23.11%	19.38%	3.73%	1.192
Associate's	6.28%	9.69%	-3.41%	0.648
Bachelor's	6.55%	20.74%	-14.19%	0.316
Master's	1.36%	7.59%	-6.23%	0.179
Professional or doctorate	0.44%	3.18%	-2.74%	0.138
Full-time student	16.89%	4.08%	12.81%	4.140
Part-time student	2.19%	0.81%	1.38%	2.704
<i>Demographic Characteristics</i>				
Male	41.94%	53.25%	-11.31%	0.788
Female	58.06%	46.75%	11.31%	1.242
White, non-Latino	57.48%	69.33%	-11.85%	0.829
African-American	14.32%	10.73%	3.59%	1.335
Latino/a	22.73%	13.83%	8.90%	1.644
Asian	4.22%	5.09%	-0.87%	0.829
Citizen	84.42%	91.17%	-6.75%	0.926
Immigrant	21.19%	15.89%	5.30%	1.334
Veteran	9.39%	13.02%	-3.63%	0.721
Married	35.24%	57.60%	-22.36%	0.612
<i>Age</i>				
16 to 24 years old	34.080	41.178	-7.098	0.828
25 to 34 years old	39.54%	13.25%	26.29%	2.984
35 to 44 years old	19.69%	21.67%	-1.98%	0.909
45 to 54 years old	14.63%	23.27%	-8.64%	0.629
55 to 64 years old	13.23%	23.55%	-10.32%	0.562
55 to 64 years old	8.31%	14.19%	-5.88%	0.586
65 years or older	4.59%	4.07%	0.52%	1.128

Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons was 1,730,969. Low-wage earners were defined as earning less than \$10 per hour on average in constant 2012 dollars. Responses are bolded if the low-wage earner share is 110% of the total or greater.

In 2012, 18 states and the District of Columbia had a higher state minimum wage than the federal level. In some of the states, the prevailing rate only applies to firms with a certain number of employees (e.g., in Illinois, for businesses with four or more employees) or to firms who earn a threshold level of profit or gross receipts (Wage

and Hour Division, 2013). Still, for the group of localities in which at least a subset of workers were mandated to be paid a minimum wage above the federal level in 2012, 20.6 percent of the workforce earned less than \$10 per hour compared to 21.9 percent for states where only the federal minimum wage prevailed.

TABLE 2: INDUSTRY CHARACTERISTICS OF LOW-WAGE EARNERS VS. TOTAL EMPLOYED POPULATION, 2003-2012

Variable	Low-Wage Earners (LWE)	Total Employed Population (TEP)	Difference (LWE-TEP)	Quotient (LWE/TEP)
Observations	292,072	1,730,969		0.169
Weighted N=	221,791,437	1,254,800,000		0.177
<i>2012 Industry</i>				
Agriculture, forestry, & fishing	2.66%	1.57%	1.09%	1.694
Mining	0.23%	0.6%	-0.37%	0.383
Construction	3.83%	6.26%	-2.43%	0.612
Manufacturing	7.87%	10.26%	-2.39%	0.767
Wholesale trade	1.94%	2.61%	-0.67%	0.743
Retail trade	25.96%	11.41%	14.55%	2.275
Transportation & warehousing	3.57%	4.28%	-0.71%	0.834
Utilities	0.28%	0.84%	-0.56%	0.333
Information & communication	1.65%	2.10%	-0.45%	0.786
Financial, banking, & real estate	3.70%	6.70%	-3.00%	0.552
Professional, scientific, & management	9.85%	11.60%	-1.75%	0.849
Education, health, & social services	22.69%	22.67%	0.01%	1.001
Food services	21.63%	6.21%	15.42%	3.483
Other services	7.94%	5.03%	2.91%	1.579
Public administration	2.26%	4.69%	-2.43%	0.482
Accommodation services	2.34%	1.00%	1.34%	2.340
Arts, entertainment, & recreation	3.78%	2.10%	1.68%	1.800
Public sector	8.75%	14.53%	-5.78%	0.602

Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons was 1,730,969. Low-wage earners were defined as earning less than \$10 per hour on average in constant 2012 dollars. Responses are bolded if the low-wage earner share is 110% of the total or greater.

It should be noted that the industries that tend to pay lower wages have also earned billions of dollars in increased operating surplus since 2010 (Table 3). Gross operating surplus (i.e., “capital”) goes up when the sum of owner income, corporate profits, transfers from other industries, and the value of new capital equipment increases. From 2010 to 2012, gross operating surplus increased by 28.7 percent in agriculture, 6.0 percent in retail, and 11.4 percent in food and accommodation services. In these three industries, which disproportionately employ low-wage workers, the total gross operating surplus was \$477.6 billion in 2012, up \$57.5 billion in just three years. The minimum wage, at the same time, has declined in real value.

Additionally, worker compensation (i.e., “labor”) as a share of industry GDP is low in these industries (Table 3). In 2012, labor’s share of industry GDP was 21.2 percent in agriculture, 55.3 percent in retail, and 64.1 percent in food and accommodation services. Meanwhile, higher-road industries tended to have larger labor shares of industry output. Of industry output, construction workers earned 63.5 percent, professional and business services earned 71.3 percent, and education-health-social services workers earned 83.0 percent. The remaining shares of industry GDP went to either capital or tax liabilities.

TABLE 3: INDUSTRY GROSS OPERATING SURPLUS, 2010 TO 2012

Industry	Gross Operating Surplus (Capital)			Compensation (Labor)
	2012 (Billions of Dollars)	Growth since 2010 (Billions of Dollars)	Percentage growth since 2010	Percentage of Industry GDP
National	\$6,559.0	\$577.3	9.7%	53.1%
Agriculture, forestry, & fishing	\$155.8	\$34.7	28.7%	21.2%
Construction	\$204.2	\$14.9	7.9%	63.5%
Manufacturing	\$1,040.6	\$138.4	15.3%	45.5%
Retail trade	\$222.9	\$12.6	6.0%	55.3%
Transportation & warehousing	\$167.4	\$11.0	7.0%	58.3%
Professional and business services	\$509.0	\$38.5	8.2%	71.3%
Education, health, & social services	\$193.9	\$13.0	7.2%	83.0%
Food and accommodation services	\$99.9	\$10.2	11.4%	64.1%
Government	\$465.9	\$30.7	7.1%	79.7%

The Minimum Wage and Average Worker Wages

To understand the actual causal impact of higher minimum wage rates on the average worker, it is critically important to control for other factors that may affect incomes, such as union membership, worker education, demographic variables, occupation, and industry of employment. Accordingly, a regression analysis is performed to accomplish this aim. The full regression analysis for all employed workers from 2003 to 2012 is available in Table A of the Appendix.

A simple correlation finds that a 10 percent increase in the minimum wage is associated with a 1.6 percent increase in the average worker's hourly wage (Table 4). However, once we account for yearly changes in the labor market (e.g., the years of the Great Recession), a 10 percent increase in the minimum wage raises the average American worker's hourly wage 2.7 percent. This 2.7 percent estimate is further corroborated in the full model, which controls for demographic, work, education, occupation, industry, and time factors.

Other factors are extremely important in determining the average worker's wage in the American labor market. Across all models, membership in a labor union remains a significant lifter of hourly wages. On average, the union wage effect is found to increase a worker's wage by between 13.3 and 14.1 percent, aligning with previous research which tends to find a 10 to 17 percent effect (Freeman, 1991; Hirsch & Macpherson, 2006; Schmitt, 2008). Workers who were part-time for "economic reasons," or involuntarily part-time, earned hourly wages that are 21.1 to 22.5 percent lower than similar workers with the same educational, work, and demographic backgrounds. Additionally, being female was still an obstacle to a higher per-hour income, as females earned 20.3 to 20.7 percent less than men, meaning that women continue to make about \$0.79 for every dollar a male earns (Joint Economic Committee, 2010). Finally, no factor is as important to an average worker's hourly wage as education. Compared to those with a high school degree or equivalent, having a bachelor's degree increases a worker's wage by 43.8 to 44.9 percent on average. Though not displayed in Table 4, Appendix Table A shows that this premium increases to about 59 percent for master's degree holders and 74 percent for those with professional or doctorate degrees.

TABLE 4: OLS REGRESSION RESULTS OF MINIMUM WAGE INCREASE ON REAL WAGES, 2003-2012

Real Wage	Simple Model	Partial Model A	Partial Model B	Full Model
10% MW increase	1.61%***	0.92%***	2.68%***	2.68%***
Union member		14.13%***	13.34%***	13.57%***
Involuntary part-time		-22.50%***	-22.10%***	-21.12%***
Female		-20.60%***	-20.74%***	-20.34%***
Bachelor's degree		44.87%***	44.85%***	43.77%***

Three asterisks (***) indicate significance at the 1% level, two asterisks (**) indicates significance at the 5% level, and one asterisk (*) indicates significance at the 10% level. Source: See Table A in the Appendix.

These results merit key takeaways. First, The 2.7 percent increase found in the full model (which has the most explanatory power) indicates that there may be spillover effects associated with a minimum wage increase. This is because the average wage goes up to the equivalent of one-fourth of the 10 percent minimum wage hike even though less than one-fifth of workers made less than \$10 an hour over the 10-year period of analysis (in constant 2012 dollars). Second, given the importance of other factors, the minimum wage could provide a considerable boost to wages for those who need it most. Low-wage earners were more likely to be involuntarily part-time, female, minorities, immigrants, students, and less-educated than the general workforce. For these particularly affected groups, the minimum wage partially offsets the strong downward pressure on hourly incomes. Additionally, if the minimum wage does in fact induce more youth to continue their education (Sutch, 2010), then the minimum wage has a very positive indirect effect on average worker wages since education is the largest determinant of a person's hourly wage.

The Minimum Wage and Employment Levels

In our analysis, increases in the federal minimum wage tend to have a very small negative impact on total employment levels (Table 5).¹ Without controlling for other factors, a 10 percent increase in the minimum wage reduces the probability of any given individual being employment by 0.8 percentage points. Once demographics, education, and yearly effects are considered, this estimate decreases to a very small 0.5 percentage-point drop. If state fixed effects are included to account for industry, economic, and political differences between states, then the minimum wage is found to have no discernible effect on employment (Allegretto et al., 2013). However, minimum wage rates do not change that much over time so this estimate may be biased.

TABLE 5: LOGISTIC AND OLS REGRESSIONS OF 10 PERCENT MINIMUM WAGE INCREASE ON EMPLOYMENT, 2003-2012

Employment Variable	Simple Model	Partial Model A	Full Model	Full Model with State FE
Prob(employment)	-0.78%***	-0.79%***	-0.49%***	-0.02%
Hours worked	-0.79%***	-0.63%***	-1.02%***	-0.02%

Three asterisks (***) indicate significance at the 1% level, two asterisks (**) indicates significance at the 5% level, and one asterisk (*) indicates significance at the 10% level. Source: See Tables B and C in the Appendix.

While it is vital to understand the impact that a minimum wage hike has on employment levels, employers may also cut back or increase the hours that their employees work in response to the policy change (Table 5). The effect of a 10 percent increase in the real value of the minimum wage on the average worker's usual hours worked per week and full regression results on hours are reported in Table C of the Appendix. In the partial models, 10 percent increase in the minimum wage reduces the average workweek by between 0.6 and 0.8 percent. Once

¹ Full logistic regression results on employment can be found in Table B of the Appendix. A logistic regression model allows for analysis of the probability of a "binary" yes-or-no variable occurring. In this case, the model reports the (positive or negative) direction of the effect that a 10 percent increase in the minimum wage has on the probability of being employed and whether the output is statistically significant. To determine the magnitude of statistically significant factors, average marginal effects are generated and reported.

yearly changes to the national economy are incorporated in a full model, a 10 percent minimum wage hike is found to reduce the average workweek by 1.0 percent. If however state fixed effects are included, the minimum wage again is estimated to have no statistically significant impact.

The examinations into employment dynamics produce a few noteworthy conclusions. First, it is likely that increases in the minimum wage have a very small negative effect on employment and hours, although in both cases an impact of 0 percent cannot definitively be ruled out. Even though the full model predicts a 0.5 percentage-point decrease in total employment associated with a 10 percent minimum wage increase, this estimate follows a recent report which analyzed data from 1971 to 2009 on 33 countries and found that a 10 percent rise in the minimum wage causes a 0.46 percent fall in adult employment (Dolton & Rosazza Bondibene, 2012). It is also on the lower end of the typical estimates found in studies, which tend to be between a 0.5 and 1.9 percent reduction in total employment (Doucouliagos & Stanley, 2009; Wolfson & Belman, 2013). Moreover, the finding that an increase in the minimum wage may reduce usual hours worked by up to 1.0 percent could be the result of either employers cutting back hours in response to the wage hike or employees who are enticed to work less and “consume” more leisure because their income is higher at fewer hours of work, or both.

Finally, the small negative impacts on employment paired with the strong positive effects on the average worker’s hourly wage means that a minimum wage increase presents policymakers with a duality: raising the minimum wage strongly reduces income inequality but may also, under the worst-case scenario, slightly reduce employment for some workers.

5. Economic Impact of Minimum Wage Theft

Descriptive Statistics of Sub-Minimum Wage Earners

Individuals who earned below the legal minimum wage are defined as sub-minimum wage earners (SMWEs) and may earn such a low wage either because they are exempt from coverage or due to wage theft victimization. Over the 10-year period of analysis, there were 3.38 million employed persons annually in the U.S. labor market on average who earned a sub-minimum wage, amounting to 2.8 percent of the employed labor force (Table 6).

Sub-minimum wage earners vary significantly from the overall American workforce. Sub-minimum wage earners tended to be less unionized, as just 4.7 percent were union members— a union membership rate that is less than two-fourths (38.7 percent) of the national rate. Indeed, an advanced analysis suggests that unionization is a remarkably effective deterrent against earning an hourly wage below the legal minimum wage: being a union member is statistically associated with a 2.1 to 2.4 percentage point decrease in the probability of earning a sub-minimum wage. From 2003 to 2012, the chances of a given worker earning less than the minimum wage were 2.9 percentage points, meaning that union membership reduced the probability by between 70.4 and 80.8 percent for an individual worker (See Appendix Table D).

Additionally, the average American worker had a usual workweek of 34.9 hours and 88.6 percent worked full-time (i.e., 35 or more hours per week). Sub-minimum wage earners, on the other hand, worked 26.4 hours on average each week. Nevertheless, a preponderance of sub-minimum wage earners (77.4 percent) still worked full-time. Like the overall low-wage workforce, far more sub-minimum wage earners were involuntarily part time (part-time for economic reasons) than the national employed population workforce (9.2 percent compared to 4.5 percent).



TABLE 6: CHARACTERISTICS OF SUB-MINIMUM WAGE EARNERS VS. TOTAL EMPLOYED POPULATION, 2003-2012

Variable	Sub-minimum Wage Earners (SMWE)	Total Employed Population (TEP)	Difference (SMWE-TEP)	Quotient (SMWE/TEP)
Observations	44,281	1,730,969		0.026
Weighted N=	33,808,692	1,254,800,000		0.027
<i>Work Characteristics</i>				
Wage (2012 \$)	\$5.795	\$21.90	-\$16.105	0.265
Union member	4.70%	12.15%	-7.45%	0.387
Covered by union	0.70%	1.43%	-0.73%	0.490
Public sector	11.09%	14.53%	-3.44%	0.763
Usual hours worked	26.37	34.91	-8.540	0.755
Full-time (35 hours or more)	77.43%	88.61%	-11.18%	0.874
Part-time for economic reasons	9.24%	4.47%	4.77%	2.067
<i>Educational Characteristics</i>				
Less than high school	26.13%	10.59%	15.54%	2.467
High school	29.20%	28.82%	0.38%	1.013
Some college, no degree	21.37%	19.38%	1.99%	1.103
Associate's	6.87%	9.69%	-2.82%	0.709
Bachelor's	11.67%	20.74%	-9.07%	0.563
Master's	3.45%	7.59%	-4.14%	0.455
Professional or doctorate	1.31%	3.18%	-1.87%	0.412
Full-time student	14.73%	4.08%	10.65%	3.610
Part-time student	1.77%	0.81%	0.96%	2.185
<i>Demographic Characteristics</i>				
Male	42.73%	53.25%	-10.52%	0.802
Female	57.27%	46.75%	10.52%	1.225
Age	36.757	41.178	-4.421	0.893
16 to 24 years old	32.59%	13.25%	19.34%	2.460
25 to 34 years old	19.10%	21.67%	-2.57%	0.881
35 to 44 years old	16.11%	23.27%	-7.16%	0.692
45 to 54 years old	15.32%	23.55%	-8.23%	0.651
55 to 64 years old	9.99%	14.19%	-4.20%	0.704
65 years or older	6.89%	4.07%	2.82%	1.693
Immigrant	22.11%	15.89%	6.22%	1.391
White, non-Latino	60.86%	69.33%	-8.47%	0.878
African-American	11.98%	10.73%	1.25%	1.116
Latino/a	20.03%	13.83%	6.20%	1.448
Asian	6.03%	5.09%	0.94%	1.185
Citizen	84.69%	91.17%	-6.48%	0.929
Veteran	8.32%	13.02%	-4.70%	0.639
Married	40.14%	57.60%	-17.46%	0.697

Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons was 1,730,969. Sub-minimum wage earners were defined as earning less than the prevailing state or federal minimum wage on average in nominal dollars, and then adjusted to 2012 dollars. Responses are bolded if the share is 110% of the total or greater.

Over half of all sub-minimum wage earners from 2003 to 2012 had a high school degree equivalent or less (55.3 percent). Those with some college but no degree were also overrepresented in the share of the American workforce that earns less than the minimum wage: 21.4 percent of sub-minimum wage earners had some college

experience compared to 19.4 percent of the general workforce. Nevertheless, just 16.5 percent of the sub-minimum wage workforce was a student either full-time (14.7 percent) or part-time (1.8 percent), indicating that vast majority of workers who earn less than the minimum wage rely on their sub-minimum hourly income to survive.

Women, young workers, the elderly, immigrants, African-Americans, Latinos and Latinas, Asians, and non-citizens are all overrepresented in the sub-minimum wage component of the American labor market. More than half (57.3 percent) of those who made less per hour than the prevailing adult minimum wage from 2003 to 2012 were women. While fully 60.9 percent of sub-minimum wage earners were white non-Latino workers, the comparable share of white workers in the national labor market was 69.3 percent. Latino/a workers were the most overrepresented minority group, with a sub-minimum wage quotient of 1.448, meaning that Latinos and Latinas were overrepresented by 44.8 percent in the sub-minimum wage workforce. The sub-minimum wage workforce also comprised 22.1 percent immigrants and 15.3 percent non-citizens compared to comparable figures of 15.9 percent immigrant and 8.8 percent non-citizen in the general workforce. Finally, the average age of the total employed population was 41.2 years old compared to 36.8 years old for those who earned less than the legal minimum wage. While workers aged 16 to 24 were overrepresented in the sub-minimum wage workforce, 67.4 percent were at least 25 years old and almost half (48.3 percent) were at least 35 years old.

TABLE 7: INDUSTRY CHARACTERISTICS OF SUB-MINIMUM WAGE EARNERS VS. EMPLOYED POPULATION, 2003-2012

Variable	Sub-minimum Wage Earners (SMWE)	Total Employed Population (TEP)	Difference (SMWE-TEP)	Quotient (SMWE/TEP)
Observations	44,281	1,730,969		0.026
Weighted N=	33,808,692	1,254,800,000		0.028
<i>2012 Industry</i>				
Agriculture, forestry, & fishing	3.32%	1.57%	1.75%	2.115
Mining	0.25%	0.6%	-0.35%	0.417
Construction	2.60%	6.26%	-3.66%	0.415
Manufacturing	5.12%	10.26%	-5.14%	0.499
Wholesale trade	1.80%	2.61%	-0.81%	0.690
Retail trade	14.31%	11.41%	2.90%	1.254
Transportation & warehousing	3.70%	4.28%	-0.58%	0.864
Utilities	0.27%	0.84%	-0.57%	0.321
Information & communication	1.67%	2.10%	-0.43%	0.795
Financial, banking, & real estate	4.96%	6.70%	-1.74%	0.740
Professional, scientific, & management	8.87%	11.60%	-2.73%	0.765
Education, health, & social services	21.45%	22.67%	-1.22%	0.946
Food service	22.32%	6.21%	16.11%	3.594
Other services	12.00%	5.03%	6.97%	2.386
Public administration	2.51%	4.69%	-2.18%	0.535
Accommodation services	2.51%	1.00%	1.51%	2.510
Arts, entertainment, & recreation	3.52%	2.10%	1.42%	1.676

Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons was 1,730,969. Sub-minimum wage earners were defined as earning less than the prevailing state or federal minimum wage on average in nominal dollars, and then adjusted to 2012 dollars. Responses are bolded if the share is 110% of the total or greater.

Listed by degree of overrepresentation, the six sectors which disproportionately paid workers an hourly wage less than the adult legal minimum were: food services, accommodation services, “other services,” the combined agriculture-forestry-fishing industry, the combined arts-entertainment-recreation industry, and retail trade.

Respectively, these sectors were overrepresented by 259.4 percent, 151.0 percent, 138.6 percent, 111.5 percent, 67.6 percent, and 25.4 percent.² Together, these six industries employ 27.3 percent of all American workers but almost three-fifths (58.0 percent) of those who earn below the minimum wage. Meanwhile, the higher-road industries with employment shares of workers at the minimum wage or higher were the utilities, construction, mining, manufacturing, and public administration sectors (Table 7).

Sub-Minimum Wage Earners across Time and Geography

Estimates reveal that weaker economies tend to have larger shares of the workforce earning less than the minimum wage. Indeed, the percentage of workers who were sub-minimum wage earners decreased from 2003 to 2005 as the economy boomed after the late-2001 recession. Since the 2005 rate of 1.9 percent (2.11 million workers), however, the sub-minimum wage earner share has increased significantly. The rate peaked at 3.4 percent of the workforce (4.18 million workers) in 2010 in the aftermath of the Great Recession, and was 3.1 percent (3.86 million workers) in 2012 (Table 8).

In constant 2012 dollars, the amount that sub-minimum wage earners made on average below the legal, adult minimum wage ranged from \$1.55 to \$1.72 per hour, with the latter figure occurring in 2012. Indeed, four of the five years in which the average amount either stolen or otherwise not paid to workers through exemptions was highest occurred in the most-recent four years. Only in 2003 was underpayment as prevalent as 2009 through 2012, indicating that the problem may be worsening. If sub-minimum earners had instead been paid at the prevailing adult minimum wage rate, they would have earned \$175.8 million more in weekly wages in 2012, \$169.3 million more per week in 2011, and \$186.4 million more per week in 2010. Conservatively assuming 50 weeks worked (i.e., two weeks for unpaid vacation or sick time off), sub-minimum wage earners would have made a total of \$73.33 billion more from 2003 to 2012 if they were just paid the actual minimum wage. This \$7.33 billion per year average conceals immense underpayment in recent years: sub-minimum wage earners would have made \$8.54 billion more if they had earned the legal minimum in 2009, \$9.32 billion more in 2010, \$8.47 billion in 2011, and \$8.79 billion in 2012.

TABLE 8: SUB-MINIMUM WAGE EARNER SHARES BY YEAR, USA

Year	Obs	Sub-minimum Wage Earners	Percentage of Workers	Hourly "Theft" (2012 \$)	Usual Weekly Hours Worked	Total Weekly Below Minimum	Annual Wages Lost Below Minimum*
2003	3,988	2,783,002	2.409%	-\$1.68	27.15	-\$127,065,999	-\$6,353,299,959
2004	3,943	2,714,972	2.291%	-\$1.61	26.79	-\$117,115,014	-\$5,855,750,706
2005	2,809	2,105,188	1.845%	-\$1.58	27.55	-\$91,855,382	-\$4,592,769,085
2006	3,816	2,763,170	2.224%	-\$1.60	26.29	-\$116,511,694	-\$5,825,584,679
2007	4,541	3,534,856	2.877%	-\$1.55	26.62	-\$146,045,375	-\$7,302,268,762
2008	4,860	3,836,015	3.044%	-\$1.63	26.52	-\$165,605,770	-\$8,280,288,486
2009	5,215	4,063,776	3.315%	-\$1.64	25.65	-\$170,849,226	-\$8,542,461,295
2010	5,430	4,178,393	3.422%	-\$1.70	26.27	-\$186,397,510	-\$9,319,875,502
2011	4,939	3,968,125	3.188%	-\$1.67	25.61	-\$169,324,886	-\$8,466,244,283
2012	4,740	3,861,195	3.058%	-\$1.72	26.45	-\$175,776,624	-\$8,788,831,209
Totals	44,281	33,808,692	2.768%	-\$1.64	26.37	-\$1,466,547,480	-\$73,327,374,000

*Assumes 50 weeks worked per year. Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons was 1,730,969. Sub-minimum wage earners were defined as earning less than the prevailing state or federal minimum wage on average in nominal dollars, and then adjusted to 2012 dollars.

² Industries included in "other services" include, among others, private households; car washes; repair of autos, equipment, and machinery; barber shops and salons; and nonprofit organizations.

TABLE 9: SUB-MINIMUM WAGE EARNER SHARES BY STATE, 2002-2013

State	Obs	Sub-minimum Wage Earners	Percentage of Workers	Hourly "Theft" (2012 \$)	Usual Weekly Hours Worked	10-Year Wages Lost (500 weeks)
ME	740	132,899	2.23%	-\$1.78	22.16	-\$262,526,784
NH	614	99,162	1.76%	-\$1.98	24.07	-\$236,743,960
VT	1,127	124,738	3.90%	-\$1.61	22.83	-\$229,642,352
MA	957	979,058	3.57%	-\$1.87	24.61	-\$2,256,460,918
RI	938	149,563	3.26%	-\$1.63	24.68	-\$300,144,404
CT	1,510	627,700	4.00%	-\$1.45	25.14	-\$1,140,313,716
NY	2,290	2,548,463	3.29%	-\$1.60	26.81	-\$5,452,278,584
NJ	925	963,233	2.87%	-\$1.75	25.77	-\$2,170,897,355
PA	1,204	1,195,162	2.38%	-\$1.67	23.25	-\$2,314,301,896
OH	1,467	1,526,153	3.13%	-\$1.45	24.18	-\$2,666,527,715
IN	461	458,268	1.82%	-\$1.69	24.35	-\$944,672,189
IL	1,896	1,962,552	3.55%	-\$1.47	26.13	-\$3,774,172,761
MI	1,216	1,229,413	3.11%	-\$1.68	23.13	-\$2,382,448,717
WI	668	488,930	2.05%	-\$1.67	21.70	-\$884,325,246
MN	625	349,098	1.87%	-\$1.59	21.01	-\$581,740,468
IA	686	272,343	2.02%	-\$1.63	22.51	-\$500,572,739
MO	678	597,384	2.50%	-\$1.58	25.94	-\$1,222,059,130
ND	431	55,029	1.94%	-\$1.61	24.29	-\$107,596,250
SD	531	65,540	2.04%	-\$1.74	23.38	-\$133,323,696
NE	528	150,050	1.91%	-\$1.64	22.94	-\$282,292,966
KS	285	136,160	1.24%	-\$1.65	24.31	-\$272,627,436
DE	714	102,697	2.81%	-\$1.55	26.96	-\$214,053,123
MD	681	425,282	2.02%	-\$1.77	27.24	-\$1,024,740,327
DC	696	85,967	3.17%	-\$1.77	28.75	-\$218,469,932
VA	675	640,614	2.03%	-\$1.69	24.79	-\$1,341,983,511
WV	542	210,269	3.09%	-\$1.42	26.77	-\$398,777,850
NC	718	811,914	2.30%	-\$1.55	25.40	-\$1,600,062,952
SC	463	391,021	2.40%	-\$1.78	27.03	-\$939,645,321
GA	777	898,545	2.37%	-\$1.74	28.17	-\$2,203,567,138
FL	1,322	1,483,769	2.10%	-\$1.66	29.86	-\$3,668,850,914
KY	502	361,369	2.22%	-\$1.75	25.75	-\$812,876,872
TN	460	524,372	2.29%	-\$1.69	26.10	-\$1,158,022,286
AL	402	392,959	2.28%	-\$1.58	27.51	-\$856,238,170
MS	364	267,212	2.54%	-\$1.53	25.64	-\$523,864,797
AR	430	280,141	2.61%	-\$1.51	24.84	-\$523,663,439
LA	452	518,404	3.09%	-\$1.61	28.36	-\$1,182,729,161
OK	477	358,121	2.54%	-\$1.57	27.21	-\$766,861,795
TX	2,272	2,602,413	2.75%	-\$1.72	28.71	-\$6,433,209,437
MT	314	75,379	1.93%	-\$1.79	22.95	-\$154,684,311
ID	396	126,910	2.16%	-\$1.65	23.17	-\$241,825,197
WY	486	50,443	2.15%	-\$1.83	23.19	-\$106,818,712
CO	942	542,228	2.51%	-\$1.59	25.42	-\$1,095,912,464
NM	381	201,307	2.62%	-\$1.67	26.83	-\$450,719,025
AZ	356	423,824	1.84%	-\$1.73	29.67	-\$1,088,427,331
UT	429	214,316	2.05%	-\$1.77	21.82	-\$414,402,789
NV	464	181,182	1.81%	-\$1.58	28.28	-\$403,942,325
WA	1,409	1,302,299	4.60%	-\$1.44	27.67	-\$2,589,577,804
OR	1,149	756,300	4.68%	-\$1.44	27.23	-\$1,477,731,545
CA	4,810	5,230,604	3.55%	-\$1.76	28.92	-\$13,325,883,230
AK	712	86,640	2.91%	-\$1.59	27.05	-\$185,848,432
HI	709	69,163	2.85%	-\$1.52	25.27	-\$132,669,898

Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Sub-minimum wage earners were defined as earning less than the state or federal minimum wage on average in nominal dollars, and then adjusted to 2012 dollars.

The 3.38 million annual sub-minimum wage earners and \$73.33 billion that would have been paid to them over 10 years if they were paid the minimum wage are disaggregated by state in Table 9. From 2003 to 2012, the five states with the highest shares of sub-minimum wage earners were Oregon (4.7 percent), Washington (4.6 percent), Connecticut (4.0 percent), Vermont (3.9 percent), Connecticut (3.6 percent) and Massachusetts (3.6 percent). At 3.5 percent, Illinois was seventh. In each of these states, the average and median nominal (i.e., unadjusted for inflation) minimum wage was high relative to the averages and medians in the other 45 states plus the District of Columbia. Over the 10 years of analysis, the five states with the largest amounts of “lost wages” by paying less than the minimum wage were California (\$13.33 billion), Texas (\$6.43 billion), New York (\$5.45 billion), Illinois (\$3.77 billion), and Florida (\$3.67 billion).

Finally, Table 10 attempts to replicate the results found by Bernhardt and her co-authors in the groundbreaking 2009-wage theft study. In that investigation, 4,387 front-line workers from Chicago, Los Angeles, and New York City who were at least 18 years old and worked in industries with median wages that were less than 85 percent of the citywide median wage were surveyed. Though not a one-for-one replication, Table 10 reports the 2012 estimates for people earning less than \$13.00 per hour in Chicago, Los Angeles, and New York City in the following occupations: health care support, protective service, building grounds and cleaning, food preparation and service, personal care service, sales, office administration and support, construction, production, transportation and moving, education and training, and arts, entertainment, and media (Bernhardt et al., 2009).

In 2012, there were 4,146 workers surveyed who matched this slice of the data and 17.0 percent earned less than the minimum wage in Chicago, 8.5 percent in New York City were sub-minimum wage earners, and 10.2 percent of Los Angeles workers were in this category. In total, 11.0 percent of the subsample in these three cities earned below the minimum wage in 2012, lower than the 26 percent estimate provided by Bernhardt and her fellow researchers (Bernhardt et al., 2009). This result may be lower due to an array of factors including underrepresentation of particularly affected groups in the CPS-ORG data (e.g., undocumented workers, etc.), possible overrepresentation of the target groups in Bernhardt et al.’s sample, differences in wage theft over time (e.g., their study could have sparked community action which has led to a reduction in minimum wage theft), or simply because the assessment is not a one-for-one replication of their study. Despite the difference between the two years, the 11.0 percent represent over half a million (511,250) workers who were not paid the minimum wage in 2012, and was higher than the national average of 8.4 percent for these workers.

TABLE 10: REPLICATION OF BERNHARDT ET AL., 2009; SUB-MINIMUM WAGE EARNERS BY MAJOR CITY, 2012

Region	Unweighted N=	Weighted N=	SMWE Share of Workforce*
Nation	45,591	37,004,616	8.36%
City of Chicago	964	1,039,121	16.97%
New York City	1,700	2,018,465	8.48%
City of Los Angeles	1,482	1,603,260	10.21%
Combined CHI, NY, LA cities	4,146	4,660,847	10.97%

*SMWE means sub-minimum wage earners. Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons was 1,730,969. Sub-minimum wage earners were defined as earning less than the prevailing state or federal minimum wage on average in nominal dollars, and then adjusted to 2012 dollars.

The Economic Impact of Sub-Minimum Wages on the American Economy

To evaluate the impact that minimum wage theft and underpayment had on the United States economy from 2003 to 2012, an input-output economic impact analysis is performed using IMPLAN data and software. Economic impact analyses account for the interrelationship between industries in the national economy, following a dollar as it cycles through the nation until it is spent elsewhere in another economy (quantified through “multipliers”). The model assumes a “local purchasing percentage” of 1.0, reports impacts in constant 2012 dollars, and assumes that the \$7.32 billion of income that would bring sub-minimum wage earners back up to the legal minimum wage is transferred from other workers in the economy. The “transfer” model is based on the possibility that employers may change the internal wage structure as a result of the minimum wage both by compressing wages of the highest paid and lowest paid and by slowing pay increases for higher-wage workers (Schmitt, 2013). It also provides for a conservative estimate of the impact that paying sub-minimum wage earners the actual adult minimum wage would have had on the economy. All estimates are the result of “induced impacts,” which effectively measure net consumer spending gains or losses as a result of the transfer of income.³

On average, if sub-minimum wage earners were paid the legal minimum wage, they would have received an additional \$2,166 in annual income (in constant 2012 dollars). Given that the average workweek of those earning sub-minimum wages was just 26.4 hours, this benefit raises wages by a significant 28.3 percent, to \$9,559 per year. If the transfer of income is from the top ten percent of per-hour earners from 2003 to 2012, their annual incomes have been \$584 lower on average. This would amount to just a 0.8 percent drop in the incomes of top hourly wage earners. On the other hand, if the transferor group is the total workforce earning more than the minimum wage, it would only cost \$60 per worker per year to pay sub-minimum wage earners the actual wage floor. This minimal cost would reduce the hourly wage of a worker in the rest of the economy by just 0.2 percent on average (Table 11).

TABLE 11: ECONOMIC IMPACT ANALYSIS OF PAYING SMWEs THE MINIMUM WAGE, MODEL INPUTS

Variable	Top 10 Percent to SMWE	Above MW to SMWE
Total transfer	\$7,324,239,494	\$7,324,239,494
<i>Sub-Minimum Wage Earners</i>		
Income gain	\$2,166	\$2,166
Percentage gain in income	28.34%	28.34%
New annual income	\$9,559	\$9,559
<i>Transferor Group</i>		
Change in income	-\$584	-\$60
Percentage change in income	-0.82%	-0.15%
Annual income (new)	\$70,510	\$39,180

Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons was 1,730,969. Sub-minimum wage earners were defined as earning less than the prevailing state or federal minimum wage on average in nominal dollars, and then adjusted to 2012 dollars.

³ Two groups of workers are utilized as transferors: the top 10 percent of per-hour wage earners and all workers who earn above the minimum wage (“the rest”). Since workers who make below, at, and near the minimum wage do not necessarily live in poor households, the \$7.33 million is distributed across all household income levels by estimates found in both Sabia & Burkhauser (2010) and Cooper & Hall (2013). For an analysis of how the transfer of dollars was allotted to households, please see Table E and Figure A in the Appendix.

The results indicate that the economy would have been better off if workers were actually paid the minimum wage (Table 12). The transfers of income in Table 11 mean that the total amount of labor income in the economy would have been unchanged. However, due to the fact that poorer households spend a larger fraction of their income in the economy, the transfer would have yielded a small positive employment effect, creating between 79,700 and 167,760 job-years in the national economy (or 7,970 to 16,776 jobs each year). The new jobs created would have paid between \$49,982 and \$50,211 in total compensation on average, generated \$1.31 to \$2.78 billion in new annual economic output, \$85.6 to \$180.2 million in total yearly federal tax revenues, and \$64.9 to \$130.4 million in total state and local government revenues per year.

While small due to the constant amount of total labor income in the economy, these estimates reveal that full compliance and enforcement of the minimum wage law would have helped the economy. The ensuing tax results suggest that increasing the number of investigators to eliminate wage theft would essentially pay for itself. Additionally, along with health occupations and real estate establishment industry gains (due to workers buying new homes), two of the top industries that would benefit most from paying workers the full minimum wage are retail stores and food and drinking places. That is, increases in national consumer demand slightly raise employment in industries where minimum wage theft is actually more prevalent than the national average.

TABLE 12: ECONOMIC IMPACT ANALYSIS OF PAYING SMWES THE MINIMUM WAGE, 2012 SINGLE-YEAR RESULTS

Variable	Top 10 Percent to SMWE	Above MW to SMWE
<i>Economic Impacts</i>		
Employment	16,776	7,970
Labor income	\$842,335,924	\$398,363,481
Compensation per job	\$50,210.80	\$49,982.44
Output	\$2,772,073,266	\$1,308,078,468
<i>Federal Taxes</i>		
Social insurance taxes	\$73,607,348	\$34,803,429
Corporate taxes	\$33,236,216	\$15,833,092
Personal income taxes	\$57,624,019	\$27,252,386
Other fees and taxes	\$15,699,588	\$7,758,827
Total tax revenue	\$180,167,171	\$85,647,734
<i>State and Local Taxes</i>		
Social insurance taxes	\$1,575,640	\$745,003
Corporate taxes	\$5,441,037	\$2,592,005
Personal income taxes	\$15,606,506	\$7,380,854
Sales taxes	\$45,608,415	\$22,991,186
Property taxes	\$43,463,880	\$21,910,127
Other fees and taxes	\$18,719,535	\$9,267,983
Total tax revenue	\$130,415,013	\$64,887,158
<i>Top Five Impact for Employment</i>		
Physicians, dentists, nursing, and care facilities	1,737	750
Real estate establishments	1,650	719
Private hospitals	1,243	508
Food services and drinking places	913	639
Retail stores	698	568

Source: The Illinois Economic Policy Institute and University of Illinois Labor Education Program use IMPLAN (IMpacts for PLANning) Version 3.0.17.2, Minnesota IMPLAN Group, Inc., © 2011. All impacts are annual impacts.

6. Impact of Raising Illinois' Minimum Wage to \$10.00

A forecast of anticipated impacts on the state labor market should Illinois raise its adult minimum wage to \$10.00 per hour can be estimated by assimilating the findings from the previous two sections. Before providing an evaluation of predicted impacts, however, it is important to understand the state of the Illinois labor market (Table 13). In 2012, there were 6.02 million employed residents in the Illinois labor market. Of these, 1.11 million (18.5 percent) of the state workforce earned \$10 or less per hour and 310,003 (5.1 percent) earned an hourly income below the legal adult minimum wage of \$8.25 per hour.

TABLE 13: CHARACTERISTICS OF ILLINOIS WORKERS, 2012

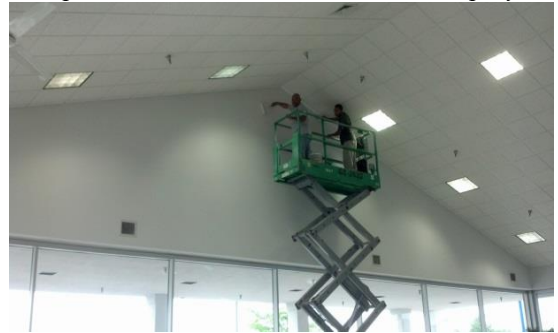
Variable	Sub-minimum Wage Earners (SMWE)	Low-Wage Earners (LWE)	Total Employed Population (TEP)	SMWE Quotient	LWE Quotient
Observations	292	1,048	5,798	0.050	0.181
Weighted N=	310,003	1,113,461	6,018,335	0.052	0.185
Wage	\$6.969	\$8.582	\$22.946	0.304	0.374
Union member	4.54%	6.59%	14.58%	0.311	0.452
Usual hours worked	26.64	29.17	33.86	0.787	0.861
Full-time (35 hours or more)	65.94%	60.94%	87.32%	0.755	0.698
Part-time for economic reasons	13.23%	15.51%	6.62%	1.998	2.343
Citizen	86.15%	83.18%	90.40%	0.953	0.920
Immigrant	21.11%	22.41%	17.03%	1.240	1.316
Male	38.61%	43.00%	52.82%	0.731	0.814
Female	61.39%	57.00%	47.18%	1.301	1.208
Age	33.610	33.921	41.869	0.803	0.810
White, non-Latino	52.35%	55.93%	68.64%	0.763	0.815
African-American	19.89%	14.57%	11.39%	1.746	1.279
Latino/a	20.45%	23.95%	13.21%	1.548	1.813
Less than high school	28.55%	21.02%	7.79%	3.665	2.698
High school	26.48%	33.62%	25.46%	1.040	1.321
Some college, no degree	24.28%	26.21%	18.71%	1.298	1.401
Associate's	7.85%	8.08%	9.32%	0.842	0.867
Bachelor's	9.43%	8.42%	24.39%	0.387	0.345
Master's	2.52%	2.11%	10.40%	0.242	0.203
Professional or doctorate	0.89%	0.54%	3.92%	0.227	0.138

Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons in Illinois was 5,798 in 2012.

Low-wage earners and sub-minimum wage earners in the Illinois economy in 2012 were similar to their counterparts in the national economy from 2003 to 2012. Compared to the overall Illinois union membership rate of 14.6 percent, the union rate among low-wage earners was less than half (6.6 percent) and the rate among sub-minimum wage earners was less than one-third (4.5 percent) of the statewide average. A strong majority (60.9 percent) of low wage earners and 65.9 percent of all sub-minimum wage earners worked full-time, compared to 87.3 percent of average employed person in Illinois. Meanwhile, the shares of low-wage workers and sub-minimum wage earners who were involuntarily part-time for economic reasons, at 15.5 percent and 13.2 percent respectively, were more than double the statewide rate of all employed people (6.6 percent). Both low-wage earners and sub-minimum wage earners were also more immigrant, more non-citizen, more female, less white non-Latino, and younger than the statewide workforce.

In the Illinois economy, about half of the workforce (52.0 percent) had some college but no degree, a high school degree, or less than a high school degree in 2012. The comparable figures, however, were 80.9 percent for low-wage earners and 79.3 percent for sub-minimum wage earners. Interestingly, after workers without a high school degree or equivalent, the educational attainment level that is most overrepresented in both the under \$10.00 an hour group and the under \$8.25 per hour group is the class of workers with some college but no degree. Those with just a high school degree or equivalent are the third-most overrepresented.

The top five industries which disproportionately employed both low-wage earners and sub-minimum wage earners were the food service, arts-entertainment-recreation, accommodation services, other services, and retail trade sectors. Together, these industries comprised 50.5 percent of the low-wage earner workforce and 54.8 percent of the sub-minimum wage earner workforce, compared to 24.4 percent of the total Illinois employed population. Similarly, the five occupation groups in which low-wage earners and sub-minimum wage earners were overrepresented in Illinois were those in food preparation, personal care, farming-fishing-forestry, building and grounds maintenance, and sales jobs. Collectively, these five occupational groups made up 50.2 percent of the low-wage earner workforce and 54.0 percent of the sub-minimum wage earner workforce. In comparison, just 24.5 percent of the total Illinois workforce was employed in any of these five jobs in 2012 (Table 14).



Occasionally an op-ed columnist or even a politician will facetiously wonder why a minimum wage increase should stop at \$9.00 or \$10.10 or \$15.00 an hour. Why not make it even higher, for instance, at \$100.00 per hour? (Gillman, 2013; Sheffield, 2013). The increase in the sub-minimum wage earner share is the reason. Even if there is no employment effect associated with a dramatic 1,112 percent increase in the minimum wage from \$8.25 to \$100.00 per hour in Illinois, the increase would, in addition to likely being inflationary, result in a substantial black market for labor. Under current levels of enforcement and coverage, such an increase would cause at least 60.1 percent of the workforce to be paid less than the minimum wage (and maybe the entire workforce). A \$100.00 wage would effectively ban work in many covered industries and entice employers in those industries to engage in wage theft to even keep operating.

Table 15 presents the range of estimated impacts of the Illinois economy if it adopted a \$10.00 minimum wage and kept enforcement and coverage constant. The results are categorized into a full model with employment effects and a best-case full-model model in which there is no effect of the increase on employment. In the model with no impact on employment, only estimates from the full model with state fixed effects (which predicted no impact on employment and hours) are used.

In the full model with employment effects, an increase in the minimum wage to \$10.00 per hour is expected to slightly reduce employment but significantly raise total labor earnings. In terms of employment, about 96,000 jobs would be lost or not created, resulting in a small increase in the unemployment rate as some workers become or stay unemployed while others drop out of the labor force to pursue more schooling, retire, or stay at home. Average hours worked each week would also decrease by 0.7 hours per week. But the increased income to minimum wage earners stimulates the creation of 26,000 jobs, which pay an average of \$48,439 per worker in total compensation. Together, these offsetting impacts lead to a net 69,705 reduction in existing and future jobs and a reduction in total annual labor-hours in the economy by 282.9 million hours. As a result, not all intended beneficiaries would gain from the minimum wage increase: 1.08 million out of 1.11 million intended beneficiaries (i.e., those earning less than \$10.00 per hour), or 97.2 percent, would benefit.

TABLE 14: INDUSTRY AND OCCUPATION CHARACTERISTICS OF ILLINOIS WORKERS, 2012

Variable	Sub-minimum Wage Earners (SMWE)	Low-Wage Earners (LWE)	Total Employed Population (TEP)	SMWE Quotient	LWE Quotient
Observations	292	1,048	5,798	0.050	0.181
Weighted N=	310,003	1,113,461	6,018,335	0.051	0.185
<i>Industry</i>					
Agriculture, forestry, & fishing	1.33%	1.12%	1.01%	1.317	1.109
Mining	0.00%	0.00%	0.13%	0.000	0.000
Construction	0.31%	1.12%	5.22%	0.059	0.215
Manufacturing	5.20%	8.44%	11.96%	0.435	0.706
Wholesale trade	0.35%	2.17%	3.03%	0.116	0.716
Retail trade	14.58%	20.82%	10.68%	1.365	1.949
Transportation & warehousing	4.12%	4.33%	5.46%	0.755	0.793
Utilities	0.00%	0.19%	0.73%	0.000	0.260
Information & communication	1.31%	1.76%	1.87%	0.701	0.941
Financial, banking, & real estate	2.52%	3.16%	7.30%	0.345	0.433
Professional, scientific, & management	8.10%	7.84%	12.31%	0.658	0.637
Education, health, & social services	20.78%	17.56%	22.96%	0.905	0.765
Food service	20.32%	17.70%	5.95%	3.415	2.975
Other services	11.40%	6.46%	5.04%	2.262	1.282
Public administration	1.23%	1.85%	3.58%	0.344	0.517
Accommodation services	2.69%	2.44%	1.09%	2.468	2.239
Arts, entertainment, & recreation	5.76%	3.04%	1.68%	3.429	1.810
<i>Occupation</i>					
Management & executive	2.14%	2.51%	10.68%	0.200	0.235
Business & financial	1.05%	0.50%	2.59%	0.405	0.193
Computer & mathematics	1.00%	0.81%	3.01%	0.332	0.269
Architectural and engineering	0.48%	0.13%	2.00%	0.240	0.065
Life, physical, & social sciences	1.04%	1.10%	0.84%	1.238	1.310
Community and social service	0.28%	0.27%	1.55%	0.181	0.174
Legal	0.00%	0.10%	1.29%	0.000	0.078
Education & training	5.77%	4.39%	6.43%	0.897	0.683
Arts, entertainment, & media	1.66%	1.08%	2.24%	0.741	0.482
Health care practice	3.83%	2.49%	5.59%	0.685	0.445
Health care support	2.65%	2.53%	1.95%	1.359	1.297
Protective service	0.28%	1.45%	1.88%	0.149	0.771
Building & grounds maintenance	5.90%	6.87%	3.56%	1.657	1.930
Food preparation	18.00%	15.96%	5.27%	3.416	3.028
Personal care	12.13%	7.63%	4.08%	2.973	1.870
Sales	16.67%	18.23%	11.03%	1.511	1.653
Office administration	9.54%	12.96%	12.61%	0.757	1.028
Farming, fishing, & forestry	1.34%	1.53%	0.52%	2.577	2.942
Construction	0.64%	1.19%	3.76%	0.170	0.316
Extraction	0.00%	0.00%	0.07%	0.000	0.000
Install, maintenance, & repair	2.18%	1.38%	3.16%	0.690	0.437
Production	5.34%	6.28%	5.83%	0.916	1.077
Transportation & moving	7.07%	8.63%	6.56%	1.078	1.316

Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. Observations of employed persons in Illinois = 5,798.

The minimum wage hike would also increase labor income in the state and grow the economy. The annual income of beneficiaries would increase by \$1.87 billion. But the minimum wage increase, through new consumer spending, would indirectly raise the wages of the rest of the workforce by a comparable amount of \$3.52 billion. Essentially, the minimum wage increase would allow the state labor force to earn more (\$5.39 billion in income) by working less (-282.9 million hours). Additionally, the minimum wage hike would reduce the poverty rate by 0.6 percentage points, from 13.7 percent to 13.1 percent. The minimum wage increase would also generate \$141.2 million in new annual state income tax revenue. These findings are similar to those of two researchers who found that a minimum wage increase in the national economy to \$9.50 an hour would reduce employment by 1.3 million workers but *increase* net economic benefits by \$14.76 billion annually (Sabia & Burkhauser, 2010).

In a second model there is a small positive impact on the employment level (as in Card & Krueger, 1994; Dube et al., 2010), and hourly wages are found to increase on average by \$0.61 per hour across the state. All of the people who are the intended beneficiaries of the policy would benefit and the poverty rate would be reduced by 1.1 percentage points (down to 12.6 percent), lifting 107,714 new Illinois adults and children above the poverty line. Ultimately, if there is no disemployment effect, raising the minimum wage to \$10.00 per hour would increase total labor income by \$7.24 billion in Illinois and generate 31,881 new jobs, increasing state income tax revenues by \$192.2 million annually.

TABLE 15: PREDICTED IMPACTS OF A MINIMUM WAGE TO \$10.00 PER HOUR IN ILLINOIS, ACCORDING TO MODELS

Summary of Illinois Impacts	With Employment Effects	No Employment Effects
	Full Model, No State Effects	Full Model, With State Fixed Effects
Minimum wage change	\$1.75	\$1.75
Employment change	-69,705	31,881
Hours change	-0.73	0
Hourly wage change	\$1.31	\$0.61
<i>Direct Annual Effects</i>		
Intended beneficiaries	1,113,461	1,113,461
Predicted beneficiaries	1,082,080	1,113,461
Predicted earnings benefit	\$1,870,059,950	\$2,302,241,812
Share of intended beneficiaries	97.2%	100.0%
<i>Annual Effects on Labor Market</i>		
Unemployment rate change	0.7%	-0.3%
Total labor-hours change	-282,891,541	55,791,242
Total labor earnings change	\$5,393,420,020	\$7,240,468,137
Income tax gain or loss	\$141,166,091	\$192,194,229
Poverty rate (Dube, 2013)	-0.6%	-1.1%
Lifted out of poverty	60,261	107,714

Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons in Illinois was 5,798 in 2012. Inputs from regressions found in column (3) of Appendix Tables A, B, and C. Illinois estimates were subsequently applied to an economic impact analysis to calculate the impact on consumer demand, using IMPLAN Version 3.0.17.2, Minnesota IMPLAN Group, Inc., © 2011. Results shown are the combination of effects.

If former sub-minimum wage earners are brought up to the \$10.00 per hour minimum wage level worker, the increase in total labor income is raised from \$5.39 billion to between \$5.41 billion and \$5.43 billion in the full model without state fixed-effects. Illinois' gross domestic product would also increase by an additional \$56.7 to \$120.2 million. Over ten years, total tax revenues would increase by between \$31.1 and \$63.0 million for

Illinois' state and local governments and by between \$42.0 and \$89.2 million for the federal government (Table 16). The increase in state and local government revenues would more than cover a doubling of the number of minimum wage theft investigators to 26. At total annual cost of \$100,000 per worker (perhaps by paying a \$70,000 average salary and including a generous benefits package), the cost to the state and local governments would be \$13.0 million, leaving between \$18.1 and \$50.0 million left over to shore up other budget shortfalls.

TABLE 16: ECONOMIC IMPACTS OF PAYING SMWES THE \$10.00 MINIMUM WAGE IN ILLINOIS, 10-YEAR RESULTS

Variable	Top 10 Percent to SMWE	Above MW to SMWE
<i>Economic Impacts</i>		
Employment (job-years)	8,210	3,870
Labor income	\$414,201,390	\$193,522,840
Compensation per job	\$50,437.70	\$50,042.64
Output (annual)	\$120,223,405	\$56,742,436
<i>Federal Taxes</i>		
Social insurance taxes	\$36,185,900	\$16,899,200
Corporate taxes	\$14,133,110	\$6,812,460
Personal income taxes	\$31,656,080	\$147,900,730
Other fees and taxes	\$7,203,310	\$3,536,710
Total tax revenue	\$89,178,390	\$42,039,100
<i>State and Local Taxes</i>		
Social insurance taxes	\$893,600	\$417,320
Corporate taxes	\$2,878,460	\$1,387,470
Personal income taxes	\$5,716,650	\$2,671,000
Sales taxes	\$21,795,540	\$10,894,280
Property taxes	\$24,134,510	\$12,063,380
Other fees and taxes	\$7,568,570	\$3,687,010
Total tax revenue	\$62,987,330	\$31,120,480
<i>Direct Effects</i>		
New total labor earnings change (Annual)	\$5,434,840,159	\$5,412,772,304

Source: The Illinois Economic Policy Institute and University of Illinois Labor Education Program use IMPLAN (IMpacts for PLANning) Version 3.0.17.2, Minnesota IMPLAN Group, Inc., © 2011. Unless otherwise noted, all impacts are decadal impacts.

7. Policy Implications and Recommendations

To reduce wage inequality, grow labor income, and ensure that workers are paid a wage commensurate with the cost of living, several public policy actions are recommended.

Nationally, the Fair Labor Standards Act needs to be amended to cover more workers. Agricultural workers, fishing workers, home care “companion” workers employed by agencies, and employees of seasonal amusement and recreational establishments are all currently exempt from the minimum wage. Including these sub-minimum wage workers in the law would raise worker wages and increase consumer demand.

Amend the Illinois minimum wage to cover employers with 2 or more employees. Currently, the Illinois minimum wage only applies to employers with four or more employees. Lowering the bar to expand coverage would lift wages of many workers up to the level of the minimum wage.

Raise the Illinois minimum wage to \$10.00 per hour and index it to the chained-Consumer Price Index. Raising the minimum wage to \$10.00 per hour would grow the state's total labor income by \$5.4 billion annually, generate at least \$141.2 million in new state income tax revenue each year, and reduce wage inequality. Indexing the minimum wage to inflation allows the minimum wage to keep up with the cost of living; the chained-weighted approach controls for substitutions of goods that consumers make across item categories (e.g., from oranges to apples, from laptops to tablets, etc.) to be a closer estimate to a cost-of-living index than the standard CPI.

Eliminate the “first 90 days with employer” subminimum. Currently, workers can be paid \$0.50 less per hour (\$7.75) in the first 90 days of employment. Elimination of this subminimum would allow seasonal workers to earn a decent wage during the entirety of their employment.

Raise the Illinois tipped minimum wage to be at or near the full minimum wage. In Illinois, the tipped minimum wage is currently 60 percent of the full minimum wage at \$4.95 per hour. Unfortunately, tipped workers are more likely to experience wage theft. Increasing the tipped minimum wage to at or near 100 percent of the minimum wage would help ensure that workers are paid at least the minimum wage.

For workers under 18 years old, raise the minimum wage to \$9.00 an hour and set it at \$1.00 below the adult minimum wage. Currently, young workers are allowed to be paid \$0.50 less per hour (\$7.75) than adult workers. Raising the youth minimum wage to \$1.00 below the adult minimum wage would increase consumer demand in the economy while maintaining an incentive for employers to hire young workers rather than let them go. A portion of the new tax revenues generated by the minimum wage hike should be dedicated to encouraging high school equivalent and college education among any young workers who are laid off.

Raise the punitive damages for not paying the minimum wage to the annualized minimum wage amount per employee, in addition to back pay. Currently, workers who file a minimum wage theft claim and win are only entitled to back pay in the amount of which they were owed. Tacking on an initial deterrent of \$20,800 per employee would discourage employers from not paying their employees the legal minimum wage.

Increase the number of minimum wage investigators in Illinois from 13 to 26. Doubling the number of investigators to enforce the minimum wage and associated penalties would ensure that the \$1.75 increase has teeth. Raising the total investigators to 26 would allow for one investigator per 228,000 workers, or one for every 10,000-16,000 sub-minimum wage earners.



Promote unionization and partner with worker centers to reduce minimum wage theft. Union membership almost fully eliminates the chance that a worker earns a sub-minimum wage, reducing the probability by up about 80 percent. Unions also raise wages and reduce income inequality. Partnerships with worker centers, would help new state investigators target particularly unlawful employers and be an effective collaborative opportunity to reduce minimum wage theft.

Pair a minimum wage increase with an expansion of the state's Earned Income Tax Credit (EITC).

The EITC tends to incentivize work, benefit the lower- and middle-classes, and reduce poverty (Schmeiser, 2012). To help offset any negative employment effect associated with a minimum wage increase, optimal labor market policy calls for combining the EITC with the minimum wage (Dube, 2013).

Conclusions

With the support of more than two-thirds of the public and six hundred labor economists, President Barack Obama has made raising the minimum wage a priority for his administration in 2014. This joint Research Report by the Illinois Economic Policy Institute and the University of Illinois Labor Education Program analyzed the impact that raising the minimum wage has on employment, hours, income, and the share of sub-minimum wage earners.

Classical economic theory relies on a set of assumptions that may not necessarily hold in reality. Indeed, research on the impact that the minimum wage has on employment is very inconclusive. The totality of the minimum wage literature finds that a 10 percent increase in the minimum wage reduces the employment level by between 0 and just 2 percent.

There are many explanations for why the minimum wage appears to have no discernible effect on total employment. One explanation is simply that the negative impact takes time to materialize. Another is that, while the number of new job hires declines, so too does the number of job *separations* through layoffs or quits. A higher “efficiency wage” encourages workers to work harder to keep their jobs, incentivizes employers to be diligent in their hiring practices, and lowers the costs of turnover. Yet another explanation is that the policy stimulates the economy through increased aggregate consumer demand by compressing wages. Moreover, research might also show no impact of a minimum wage increase on employment because companies have other “channels of adjustment,” such as reducing customer service, accepting lower profits, or passing on any higher labor costs to consumers through small price increases. A higher minimum wage may further incentivize teenagers to invest in more schooling, increasing the amount of “human capital” in the economy. Finally, employers may respond to the minimum wage hike by simply ignoring it or by engaging in wage theft. Indeed, research has also profiled many egregious minimum wage violations, and from 2003 to 2012, there were 3.38 million sub-minimum wage earners on average each year (2.8 percent of the workforce).

A 10 percent increase in the minimum wage raises the *average* American worker's hourly wage by 2.7 percent. Membership in a labor union also remains a significant lifter of hourly wages, increasing a worker's wage by between 13.3 and 14.1 percent on average, but no factor is as important as education. Compared to those with a high school degree or equivalent, having a bachelor's degree increases an average worker's hourly wage by 43.8 to 44.9 percent. Unsurprisingly, low-wage earners are more likely to be involuntarily part-time, female, and less-educated than the general workforce. A minimum wage increase could thus be a considerable lifter of wages for those who need it most.

Increases in the minimum wage tend to have a very small negative impact on total employment levels. A 10 percent increase in the minimum wage is found to reduce the probability of having a job by 0.5 percentage points, although the range of estimates includes no negative impact. Similarly, a 10 percent minimum wage hike lowers an average worker's usual hours worked per week by between 0.6 and 1.0 percent, although once again the range of estimates does include zero predicted effect. Any reductions in the number of jobs or in average hours worked

could be the result of either employers cutting back in response to higher labor costs or employees who decide to work less because their income is higher at fewer hours of work, or a combination of both effects.

Overall, the sub-minimum wage earner share of the economy increased dramatically due to the Great Recession, peaking at 3.4 percent of the workforce (4.18 million workers) in 2010. The share was 3.1 percent of the workforce (3.86 million workers) in 2012. As a result, sub-minimum wage earners would have made a total of \$73.33 billion more from 2003 to 2012 if they were just paid the actual minimum wage in their state, including \$8.79 billion more in 2012. Over that timeframe, the five states with the largest amounts of “lost wages” by paying less than the minimum wage were California, Texas, New York, Illinois, and Florida.

The economy would have been better off if workers were actually paid the minimum wage. At an average individual cost of just \$584 per year to the top 10 percent of earners in America or a small \$60 average cost per worker per year for everyone who earned more than the minimum wage, the increase in income for sub-minimum wage earners would have created between 7,970 and 16,776 jobs in the national economy (79,700 to 167,760 job-years). The transfer in labor income would have generated \$1.31 to \$2.78 billion in new annual economic output. There also would have been an \$85.6 to \$180.2 million benefit in total yearly federal tax revenues and a \$64.9 to \$130.4 million gain in total state and local government revenues per year.

In Illinois, the top five industries which disproportionately employed both low-wage earners and sub-minimum wage earners were the food service, arts-entertainment-recreation, accommodation services, other services, and retail trade sectors. Similarly, the five occupation groups in which low-wage earners and sub-minimum wage earners were overrepresented in Illinois were those in food preparation, personal care, farming-fishing-forestry, building and grounds maintenance, and sales jobs.



It is predicted that a 21.2-percent minimum wage hike to \$10.00 per hour in Illinois would either slightly reduce employment or have no employment impact but significantly raise total labor earnings. Employment could fall by 70,000 workers (or increase by 32,000 workers) and average hours worked each week could also decrease by 0.7 hours per week. Nevertheless, the minimum wage hike would increase labor income by \$1.87 billion for intended beneficiaries and by at least \$5.39 billion total for the whole economy. The minimum wage increase would generate \$141.2 to \$192.2 million in new annual state income tax revenue alone. If sub-

minimum wage earners are brought up to the \$10.00 per hour minimum wage level, the increase in total labor income would be raised from \$5.39 billion to between \$5.41 billion and \$5.43 billion. Over ten years, total tax revenues would also increase by between \$31.1 and \$63.0 million for Illinois' state and local governments and by between \$42.0 and \$89.2 million for the federal government.

To reduce wage inequality, grow labor income, and ensure that workers are paid a wage commensurate with the cost of living several public policy actions are recommended. At the national level, the Fair Labor Standards Act needs to be expanded to cover more workers, especially agricultural, home care “companion,” and seasonal amusement and recreational establishment workers. In Illinois, the minimum wage should be expanded to cover employers with 2 or more employees and should be raised to \$10.00 per hour and indexed to the chained-Consumer Price Index. The “first 90 days” subminimum should also be eliminated, the tipped minimum wage should be raised to be at or near the full minimum rate, and the minimum wage for workers under 18 years old

should be set at \$1.00 below the adult rate to maintain an incentive for employers to retain young workers. The minimum wage increase in Illinois should be paired with an expansion of the state's Earned Income Tax Credit, which helps offset any negative employment effect that occurs due to the minimum wage hike.

On the enforcement side, three steps should be taken to ensure that workers are earning *at least* the minimum wage rate. First, the punitive damages for not paying the minimum wage should be increased to the annualized minimum wage amount per employee in addition to back pay, meaning an initial deterrent of \$20,800 per employee. Second, the number of minimum wage investigators in Illinois should be doubled from 13 to 26, such that there would be one investigator per 228,000 workers, or one for every 10,000 to 16,000 sub-minimum wage earners. Finally, unionization should be promoted and partnerships with worker centers expanded to reduce minimum wage theft. Union membership reduces the probability that a worker earns a sub-minimum wage by about 80 percent by raising wages and giving workers a voice. Worker centers can help new state investigators target particularly bad employers to reduce minimum wage theft.

While there has recently been much public debate on the merits of raising the minimum wage, this report finds a substantial simulative impact of the increase on average wages and a minimal negative effect on employment. However, any increase in the minimum wage should be accompanied by an expansion in coverage and an increase in enforcement to ensure that the policy change actually helps its intended beneficiaries. In Illinois, a minimum wage increase to \$10.00 per hour would generate positive impacts on earnings and tax revenues, particularly if it is fully enforced. Ultimately, a minimum wage increase would reduce income inequality, increase consumer demand, and grow the Illinois economy.

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Appendix

TABLE A: OLS REGRESSION OF IMPACT OF MINIMUM WAGE INCREASE ON WAGES, ALL WORKERS, 2003-2012

ln(wage)	(1)		<u>Wages</u> (2)		(3)		(4)	
	Coefficient	(St. Err.)	Coefficient	(St. Err.)	Coefficient	(St. Err.)	Coefficient	(St. Err.)
ln(minimum wage)	0.1610***	(0.0025)	0.0917***	(0.0021)	0.2683***	(0.0031)	0.2680***	(0.0031)
Union member			0.1413***	(0.0012)	0.1334***	(0.0012)	0.1357***	(0.0012)
Age			0.0492***	(0.0002)	0.0490***	(0.0002)	0.0482***	(0.0002)
Age ²			-0.0005***	(0.0000)	-0.0005***	(0.0000)	-0.0005***	(0.0000)
Female			-0.2060***	(0.0008)	-0.2074***	(0.0008)	-0.2034***	(0.0008)
Veteran			0.0179***	(0.0011)	0.0103***	(0.0013)	0.0098***	(0.0013)
Married			0.0693***	(0.0008)	0.0698***	(0.0008)	0.0678***	(0.0008)
Citizen			0.1060***	(0.0019)	0.1067***	(0.0019)	0.1050***	(0.0019)
Immigrant			-0.0225***	(0.0016)	-0.0267***	(0.0016)	-0.0257***	(0.0016)
Student, full-time			-0.1327***	(0.0021)	-0.1331***	(0.0021)	-0.1286***	(0.0021)
Student, part-time			-0.0762***	(0.0040)	-0.0783***	(0.0040)	-0.0739***	(0.0039)
Public sector			-0.0472***	(0.0011)	-0.0450***	(0.0011)	-0.0431***	(0.0011)
Part-time, econ reasons			-0.2250***	(0.0018)	-0.2210***	(0.0018)	-0.2112***	(0.0018)
White			0.0097***	(0.0017)	0.0144***	(0.0017)	0.0149***	(0.0017)
African-American			-0.0968***	(0.0019)	-0.0883***	(0.0019)	-0.0859***	(0.0019)
Latino			-0.0531***	(0.0018)	-0.0489***	(0.0018)	-0.0461***	(0.0018)
Less than high school			-0.6215***	(0.0015)	-0.6238***	(0.0015)	-0.6119***	(0.0015)
High school			-0.4487***	(0.0011)	-0.4485***	(0.0011)	-0.4377***	(0.0011)
Some college			-0.3578***	(0.0012)	-0.3581***	(0.0012)	-0.3495***	(0.0012)
Associate's			-0.2707***	(0.0014)	-0.2695***	(0.0014)	-0.2650***	(0.0014)
Master's			0.1515***	(0.0016)	0.1521***	(0.0016)	0.1513***	(0.0015)
Professional/Doctorate			0.3089***	(0.0024)	0.3080***	(0.0023)	0.3042***	(0.0024)
Occupation Dummies	N		N		N		Y	
Industry Dummies	N		N		N		Y	
Time Fixed Effects	N		N		Y		Y	
Constant	2.5947***	(0.0047)	1.6972***	(0.0059)	1.4285***	(0.0070)	1.4398***	(0.0070)
R ²	0.023		0.373		0.375		0.382	
Observations	1,730,415		1,723,144		1,723,144		1,723,144	
Weighted N=	1.26 billion		1.25 billion		1.25 billion		1.25 billion	

Three asterisks (***) indicate significance at the 1% level, two asterisks (**) indicates significance at the 5% level, and one asterisk (*) indicates significance at the 10% level. Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons was 1,730,969. Low-wage earners were defined as earning less than \$10 per hour on average in constant 2012 dollars.

TABLE B: LOGISTIC REGRESSION OF IMPACT OF MINIMUM WAGE INCREASE IN EMPLOYMENT, AVERAGE MARGINAL/PARTIAL EFFECTS, U.S. POPULATION, 2003-2012

Prob(Employed)	(1)		<u>Employment</u> (2)		(3)		(4)	
	Coefficient	(St. Err.)	Coefficient	(St. Err.)	Coefficient	(St. Err.)	Coefficient	(St. Err.)
ln(minimum wage)	-0.0777***	(0.0015)	-0.0793***	(0.0013)	-0.0494***	(0.0019)	-0.0024	(0.0031)
Age			0.0314***	(0.0001)	0.0313***	(0.0001)	0.0314***	(0.0001)
Age ²			-0.0004***	(0.0000)	-0.0004***	(0.0000)	-0.0004***	(0.0000)
Female			-0.1012***	(0.0005)	-0.1025***	(0.0005)	-0.1021***	(0.0005)
Veteran			-0.0273***	(0.0007)	-0.0344***	(0.0008)	-0.0345***	(0.0008)
Married			0.0107***	(0.0005)	0.0110***	(0.0005)	0.0106***	(0.0005)
Citizen			0.0355***	(0.0013)	0.0355***	(0.0013)	0.0378***	(0.0013)
Immigrant			0.0199***	(0.0011)	0.0186***	(0.0011)	0.0233***	(0.0011)
Student, full-time			-0.1472***	(0.0011)	-0.1471***	(0.0011)	-0.1474***	(0.0011)
White			0.0573***	(0.0010)	0.0582***	(0.0010)	0.0629***	(0.0011)
African-American			-0.0128***	(0.0012)	-0.0114***	(0.0012)	0.0018	(0.0013)
Latino			0.0432***	(0.0011)	0.0438***	(0.0011)	0.0571***	(0.0012)
Less than high school			-0.2013***	(0.0008)	-0.2014***	(0.0008)	-0.1988***	(0.0009)
High school			-0.0971***	(0.0007)	-0.0970***	(0.0007)	-0.0962***	(0.0007)
Some college			-0.0580***	(0.0008)	-0.0578***	(0.0008)	-0.0569***	(0.0008)
Associate's			-0.0146***	(0.0010)	-0.0142***	(0.0010)	-0.0157***	(0.0010)
Master's			0.0306***	(0.0012)	0.0305***	(0.0012)	0.0314***	(0.0011)
Professional/Doctorate			0.0931***	(0.0018)	0.0928***	(0.0018)	0.0939***	(0.0018)
Time Fixed Effects	N		N		Y		Y	
State Fixed Effects	N		N		N		Y	
Constant	0.6154***	(0.0002)	0.6217***	(0.0002)	0.6217***	(0.0002)	0.6217***	(0.0002)
R ²	0.001		0.235		0.235		0.239	
Observations	3,194,414		3,149,943		3,149,943		3,149,943	

Three asterisks (***) indicate significance at the 1% level, two asterisks (**) indicates significance at the 5% level, and one asterisk (*) indicates significance at the 10% level. Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons was 1,730,969. Low-wage earners were defined as earning less than \$10 per hour on average in constant 2012 dollars.

TABLE C: SIMPLE OLS REGRESSION OF IMPACT OF MINIMUM WAGE INCREASE IN HOURS, ALL WORKERS, 2003-2012

ln(Hours Worked)	(1)		<u>Hours</u> (2)		(3)		(4)	
	Coefficient	(St. Err.)	Coefficient	(St. Err.)	Coefficient	(St. Err.)	Coefficient	(St. Err.)
ln(minimum wage)	-0.0792***	(0.0027)	-0.0634***	(0.0024)	-0.1016***	(0.0035)	-0.0023	(0.0060)
Union member			0.0615***	(0.0014)	0.0632***	(0.0014)	0.0736***	(0.0014)
Age			0.0289***	(0.0002)	0.0290***	(0.0002)	0.0288***	(0.0002)
Age ²			-0.0004***	(0.0000)	-0.0004***	(0.0000)	-0.0004***	(0.0000)
Female			-0.1280***	(0.0009)	-0.1273***	(0.0009)	-0.1264***	(0.0009)
Veteran			-0.0011	(0.0014)	-0.0035**	(0.0016)	0.0018	(0.0016)
Married			-0.0279***	(0.0010)	-0.0279***	(0.0010)	-0.0295***	(0.0010)
Citizen			-0.0088***	(0.0022)	-0.0087***	(0.0022)	-0.0065***	(0.0022)
Immigrant			0.0187***	(0.0020)	0.0200***	(0.0020)	0.0281***	(0.0020)
Student, full-time			-0.5550***	(0.0020)	-0.5547***	(0.0020)	-0.5515***	(0.0020)
Student, part-time			-0.1496***	(0.0038)	-0.1489***	(0.0038)	-0.1485***	(0.0038)
Public sector			-0.0354***	(0.0014)	-0.0358***	(0.0014)	-0.0376***	(0.0014)
Part-time, econ reasons			-0.3344***	(0.0017)	-0.3346***	(0.0017)	-0.3333***	(0.0017)
White			-0.0206***	(0.0020)	-0.0218***	(0.0020)	-0.0177***	(0.0021)
African/American			0.0318***	(0.0023)	0.0298***	(0.0023)	0.0246***	(0.0024)
Latino			0.0357***	(0.0021)	0.0347***	(0.0021)	0.0302***	(0.0022)
Less than high school			-0.0050***	(0.0018)	-0.0043***	(0.0018)	-0.0095***	(0.0018)
High school			0.0621***	(0.0015)	0.0621***	(0.0015)	0.0596***	(0.0015)
Some college			0.0485***	(0.0016)	0.0484***	(0.0015)	0.0454***	(0.0016)
Associate's			0.0581***	(0.0018)	0.0579***	(0.0018)	0.0564***	(0.0018)
Master's			-0.0881***	(0.0032)	-0.0880***	(0.0032)	-0.0869***	(0.0032)
Professional/Doctorate			-0.0408***	(0.0057)	-0.0405***	(0.0057)	-0.0419***	(0.0057)
Time Fixed Effects	N		N		Y		Y	
State Fixed Effects	N		N		N		Y	
Constant	3.6276***	(0.0050)	3.0742***	(0.0067)	3.1257***	(0.0080)	2.9430***	(0.0120)
R ²	0.001		0.255		0.256		0.259	
Observations	790,701		784,499		784,499		784,499	
Weighted N=	567 million		563 million		563 million		563 million	

Three asterisks (***) indicate significance at the 1% level, two asterisks (**) indicates significance at the 5% level, and one asterisk (*) indicates significance at the 10% level. Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons was 1,730,969. Low-wage earners were defined as earning less than \$10 per hour on average in constant 2012 dollars.

TABLE D: LOGISTIC REGRESSION RESULTS OF UNION MEMBERSHIP ON THE PROBABILITY OF EARNING A SUB-MINIMUM WAGE, 2003-2012

Prob(SMWE)	Partial Model A	Full Model	Full Model with State FE
Union member	-2.05% ***	-2.33% ***	-2.35% ***
Constant	2.91% ***	2.91% ***	2.91% ***

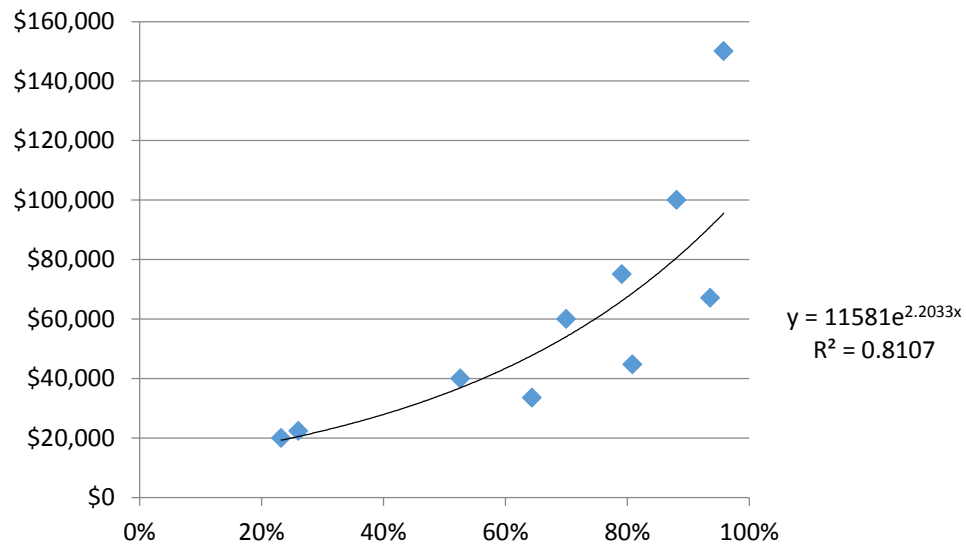
Three asterisks (***) indicate significance at the 1% level, two asterisks (**) indicates significance at the 5% level, and one asterisk (*) indicates significance at the 10% level. Source: CPS-ORG, Center for Economic and Policy Research Uniform Data Extracts, 2003 to 2012. Statistics are adjusted by the outgoing rotation group earnings weight to match the total population 16 years of age or older. The total number of observations of employed persons was 1,730,969. Low-wage earners were defined as earning less than \$10 per hour on average in constant 2012 dollars.

TABLE E: IMPLAN MODEL INPUTS OF WHICH HOUSEHOLDS BENEFIT FROM EARNING THE MINIMUM WAGE

<i>Who is Helped by the Minimum Wage?</i>	
2011	Share of Minimum Wage Workforce (Sabia & Burkhauser, 2010)
Below Poverty Line (\$22,350)	26.03%
Below 150% of Poverty Line (\$33,525)	38.36%
Below 200% of Poverty Line (\$44,700)	16.44%
Below 300% of Poverty Line (\$67,050)	12.79%
Above 300% of Poverty Line (More than \$67,050)	6.39%
2013	Direct and Indirectly Affected Share of Total Workforce (Cooper & Hall, 2013)
Less than \$20,000	23.20%
\$20,000-\$39,999	29.40%
\$40,000-\$59,999	17.40%
\$60,000-\$74,999	9.10%
\$75,000-\$99,999	9.00%
\$100,000-\$149,999	7.70%
\$150,000 or more	4.20%
Implan Estimates Using Equation Derived from Both Studies	Income Level = 11,581e ^{2.2033*(MW Share)}
Less than \$10,000	9.536%
\$10,000-14,999	4.768%
\$15,000-\$24,999	9.536%
\$25,000-\$34,999	23.840%
\$35,000-\$49,999	23.840%
\$50,000-\$74,999	23.840%
\$75,000-\$99,999	2.319%
\$100,000 or more	2.319%

Source: Sabia & Burkhauser (2010) and Cooper & Hall (2013). Source: The Illinois Economic Policy Institute and University of Illinois Labor Education Program use IMPLAN (IMPacts for PLANning) Version 3.0.17.2, Minnesota IMPLAN Group, Inc., © 2011. Inputs are incorporated into a household spending model. "MW Share" is the percentage of households with at least one minimum wage worker in each income group.

FIGURE A: GRAPHICAL REPRESENTATION OF ESTIMATED BENEFICIARIES, DERIVED FROM SABIA & BURKHAUSER (2010) AND COOPER & HALL (2013)



Source: Sabia & Burkhauser (2010) and Cooper & Hall (2013). The Y-axis is the income level and the X-axis is the estimated number of households impacted by paying workers more than the subminimum wage, adding up to 100 percent. Results are used to estimate which households along the income distribution directly benefit from a minimum wage increase. Equation was found by fitting values in Microsoft Word 2010 using an exponential trend. Please contact the authors for more information.



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