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## Making Sense of the Minimum Wage A Roadmap for Navigating Recent Research

BY JEFFREY CLEMENS

### EXECUTIVE SUMMARY

**T**he new conventional wisdom holds that a large increase in the minimum wage would be desirable policy. Advocates for this policy dismiss the traditional concern that such an increase would lower employment for many of the low-skilled workers that the increase is intended to help. Recent economic research, they claim, demonstrates that the disemployment effects of increasing minimum wages are small or nonexistent, while there are large social benefits to raising the wage floor.

This policy analysis discusses four ways in which the case for large minimum wage increases is either mistaken or overstated.

First, the new conventional wisdom misreads the totality of recent evidence for the negative effects of minimum wages. Several strands of research arrive regularly at the conclusion that high minimum wages reduce opportunities for disadvantaged individuals.

Second, the theoretical basis for minimum wage

advocates' claims is far more limited than they seem to realize. Advocates offer rationales for why current wage rates might be suppressed relative to their competitive market values. These arguments are reasonable to a point, but they are a weak basis for making claims about the effects of large minimum wage increases.

Third, economists' empirical methods have blind spots. Notably, firms' responses to minimum wage changes can occur in nuanced ways. I discuss why economists' methods will predictably fail to capture firms' responses in their totality.

Finally, the details of employees' schedules, perks, fringe benefits, and the organization of the workplace are central to firms' management of both their costs and productivity. Yet data on many aspects of workers' relationships with their employers are incomplete, if not entirely lacking. Consequently, empirical evidence will tend to understate the minimum wage's negative effects and overstate its benefits.

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## INTRODUCTION

For decades, debates over the minimum wage have been tense among advocates, policymakers, and professional researchers alike. While professional economists were once broadly skeptical of the benefits of a minimum wage, that consensus has eroded.

Shifts in the views of media, advocates, policymakers, and researchers each have their own story. A striking example comes from the *New York Times*. In 1987, the *Times* editorialized that “The Right Minimum Wage” is \$0.<sup>1</sup> But in 2015, it opined that “fifteen dollars, phased in gradually . . . would be adequate and feasible.”<sup>2</sup> Even more recently, it claimed that

a living wage is an antidepressant. It is a sleep aid. A diet. A stress reliever. It is a contraceptive, preventing teenage pregnancy. It prevents premature death. It shields children from neglect.<sup>3</sup>

In the eyes of the *Times*, the minimum wage has taken a 30-year journey from zero to hero. There is no ill, it seems, that a higher minimum wage cannot alleviate, if not outright cure.

Following decades of moderate minimum wage changes, select cities and states have recently passed substantial increases. In Seattle, San Francisco, and New York City, the minimum wage has already reached the milestone of \$15. Recent laws passed by California, Illinois, Maryland, Massachusetts, New Jersey, and New York call for statewide increases to \$15 in the coming years. Early in February of 2019, the U.S. House Committee on Education and Labor held a hearing to advance the agenda to take a \$15 wage floor nationwide.<sup>4</sup>

An erosion of the consensus among academic economists predates this lurch in public policy. Cracks in this consensus emerged in earnest when David Card and Alan Krueger wrote their book *Myth and Measurement: The New Economics of the Minimum Wage* in the 1990s.<sup>5</sup> Even so, a 2005 survey found that only 17 percent of economists favored increasing the federal minimum wage from the then floor of \$5.15 per hour to \$6.15.<sup>6</sup> A

more recent wave of research has coincided with a broader shift among academic economists. In 2013, nearly half the respondents to a survey by the University of Chicago agreed that a \$9 federal minimum wage would be “desirable policy.”<sup>7</sup> In 2015, only 26 percent of economists in a subsequent University of Chicago survey worried that a \$15 minimum wage would significantly reduce employment for low-wage workers.<sup>8</sup>

Proponents of high minimum wages argue that their position is supported by the best evidence, giving them the scientific high ground. But does the research really justify this confidence and the accompanying shift in the conventional wisdom? Though proponents of a higher wage can cite many papers to support their view, their reading of recent research is incomplete. The research these proponents ignore has many strengths, including transparent research methods, analyses of high-quality data, and a truly randomized experiment. In contrast to the research emphasized by advocates, the broader body of work regularly finds that increases in minimum wages cause job losses for individuals with low skill levels.

Another problem with advocates’ calls for a much higher minimum wage is that the theoretical basis for their claims is far more limited than they seem to realize. Advocates offer rationales for why wage rates might be suppressed relative to competitive market values. These arguments are reasonable to a point, but they are a weak basis for making claims about the effects of large minimum wage increases.

Third, economists’ empirical methods have blind spots. Notably, firms’ responses to minimum wage changes can occur with nuanced dynamics. I discuss why economists’ methods will predictably fail to capture such dynamics in their totality.

Finally, the details of employees’ schedules, perks, fringe benefits, and the organization of the workplace are central to firms’ management of both their costs and productivity. Yet data on many dimensions of workers’ relationships

with their employers are incomplete, if not entirely lacking. Consequently, empirical evidence tends to understate the minimum wage's negative effects and overstate its benefits.

## WHAT CAN WE CONCLUDE FROM RECENT RESEARCH?

Media coverage of minimum wage changes provides a window into the minimum wage research landscape. Changes in states' minimum wage rates bring news stories on the wage gains workers will receive and the number of workers who are ostensibly poised to receive them. As reported on December 27, 2018, in a headline from *USA Today*, "From California to New York, States Are Raising Minimum Wages in 2019 for 17 Million Workers."<sup>9</sup> The article does not consider that some of those workers may lose employment under the higher wage. It does not mention how employers might offset the minimum wage's effects on their costs or how such changes might affect workers' lives.

Where do the authors of such articles turn for their facts? The *USA Today* article draws on calculations by the National Employment Law Project (NELP). Similar articles from CBS, NPR, and other news outlets draw on calculations from the Economic Policy Institute (EPI).<sup>10</sup> In turn, these organizations cite academic research to support their views.

Minimum wage analyses from NELP and EPI draw on research papers that have challenged the traditional view that minimum wage increases reduce employment. Key research in this vein includes a 2010 paper by Arindrajit Dube, T. William Lester, and Michael Reich;<sup>11</sup> a 2011 paper by Sylvia Allegretto, Dube, and Reich;<sup>12</sup> a 2017 paper by Allegretto, Dube, Reich, and Ben Zipperer;<sup>13</sup> and a 2019 paper by Doruk Cengiz, Dube, Attila Lindner, and Zipperer.<sup>14</sup> Each of those papers analyzes a large set of minimum wage changes enacted by U.S. states or the federal government that spans several decades. In every case, the authors conclude that there is no evidence to support the view that minimum wage increases cause job losses. In a recent

piece of congressional testimony, Reich used this research to argue that minimum wage increases up to \$15 have "no negative employment effects."<sup>15</sup>

In addition to influencing policy discussions, the papers previously referenced have been influential within the professional research community. Importantly, these studies are not extreme outliers. A 2016 analysis by Paul Wolfson and Dale Belman found that the estimated effects of minimum wage increases on employment have been, on average, quite small in recent studies.<sup>16</sup>

At the same time, a great deal of recent research finds that minimum wage increases cause job losses among low-skilled population groups. In the remainder of this section, I discuss four strands of research that fit this description. In the first, a number of papers use the same data to study the same minimum wage changes as the papers referenced previously, but arrive at different conclusions. The second strand of research analyzes more compactly defined episodes of minimum wage increases within the recent experience of U.S. cities and states. A third strand analyzes minimum wage changes using high-quality administrative data from Europe. Finally, I discuss a paper that analyzes a truly randomized experiment involving the imposition of minimum wages in an online labor market.

## Research on the Long History of U.S. Minimum Wage Changes

The research most often discussed by U.S. media analyzes over three decades of U.S. state and federal minimum wage changes. In what follows, I focus on the substantive issues at stake in the debate within this strand of research. Readers interested in references to key entries in this debate can find a roadmap in the endnotes.<sup>17</sup>

Researchers estimate the effects of minimum wage changes by making comparisons between states that increased their minimum wages and states that did not. The goal is to infer whether an increase in minimum wages led to the number of jobs changing differently

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than it otherwise would have. The key question for evaluating the quality of these analyses is whether the states being compared are “good counterfactuals.” That is, do the states being compared reliably allow us to infer how employment would have changed if states had not increased their minimum wages? Debates between researchers are in large part debates over which approaches to selecting comparisons generate “good counterfactuals” and hence “unbiased estimates.”

In their 2008 book *Minimum Wages*, David Neumark and William Wascher summarized existing research as being broadly supportive of the view that minimum wages adversely affect low-skilled workers.<sup>18</sup> Card and Krueger’s work notwithstanding, Neumark and Wascher argued that the weight of the evidence implied that minimum wage increases reduce employment. In their own empirical research, Neumark and Wascher have relied on the broadest possible set of comparisons between states that increased minimum wages and states that did not. In contrast, papers finding that minimum wage changes have no effect on employment typically rely on subsets of the available comparisons. Because their comparisons are less selected, Neumark and Wascher’s analyses are less prone to charges of data mining. This makes their approach the natural default unless there is a compelling case that their method would result in systematically biased estimates. Critics of their research argue that such biases do exist and are so severe that Neumark and Wascher’s estimates are not “credible.”

The claim that a scholarly work lacks credibility is a strong one, but does the strength of the evidence match the strength of the claim? The answer is no, because there is remarkably little fire behind the smoke. To date, direct evidence for the strengths and weaknesses of alternative research methods is in surprisingly short supply. In their own terminology, the biases alleged by Dube, Lester, and Reich are “unobserved.” That is, their argument is not built on evidence of specific economic forces that, in their telling, give rise to systematic

biases. If anything, states appear to enact minimum wage increases when their labor markets are expanding more rapidly than the labor markets in other states. This will tend to bias analyses toward finding that minimum wage increases have a positive effect on employment, which is the opposite of what Neumark and Wascher’s critics allege.

As Neumark observes in a 2018 review of recent research, papers using a variety of best-practice methodologies have concluded that minimum wage increases reduce employment.<sup>19</sup> Indeed, several recent papers use methods that are designed to account for precisely the kind of unobserved forces that Dube, Lester, and Reich claim bias traditional minimum wage research. Two examples that analyze roughly the same history of U.S. minimum wage changes include a 2017 paper by David Powell and a 2012 paper by Yusuf Baskaya and Yona Rubinstein.<sup>20</sup> Both papers estimate substantial negative effects of minimum wage increases on teen employment, echoing the traditional research finding.

In summary, the segment of the minimum wage literature that simultaneously analyzes three decades of minimum wage changes remains contentious. Relative to Neumark and Wascher’s early estimation frameworks, some methodologies for accounting for nuanced biases yield smaller estimates, while others yield larger estimates. Because direct evidence in favor of one approach and against others is in short supply, strong conclusions based on this strand of research alone are unwarranted.

### Research on Recent U.S. Minimum Wage Changes

The debate described above is difficult to evaluate because key differences between competing studies are opaque. The studies in question attempt to analyze hundreds of distinct events simultaneously. An advantage of this approach is that it may provide evidence for the average effect of minimum wage increases across a broad range of settings. But when estimates are in dispute, a drawback of such an analysis is that it becomes difficult to

determine why competing studies of the same events arrive at different conclusions.

A number of recent studies take an alternative approach: they analyze compact historical episodes in isolation. The key benefit of this approach is that differences between studies can be transparently debated with reference to the events surrounding a single historical episode. Transparency of this sort is crucial for evaluating competing studies. For this reason, the approach of focusing on compact historical episodes is standard practice in other areas of economic research, including analyses of major health and tax policy reforms.

My own work on the minimum wage has separately considered two distinct historical episodes. In a recently published work, Michael Wither and I estimate the effects of the federal minimum wage changes enacted during the Great Recession.<sup>21</sup> The 2007–2009 federal increases had greater effects in some states than others, depending on the initial level of a state’s minimum wage. We use data that follow individuals over time, which allows us to separate minimum wage workers from workers with moderately higher skills. We find that employment among minimum wage workers declined far more in states that were “fully bound” by the federal minimum wage changes than in states that were not. Notably, employment among moderately higher-skilled individuals does not exhibit this pattern; changes in the employment of these workers were comparable between the two groups of states. This bolsters the case that our analysis is not biased by differences in the severity of states’ underlying recessions. Indeed, housing market indicators reveal that our estimates are more likely to be biased toward finding positive effects of minimum wage increases than negative effects. We estimate that the federal minimum wage increases enacted during the Great Recession reduced employment among low-skilled individuals by hundreds of thousands of jobs.

Like other minimum wage research that has drawn public attention, our work has its detractors. Zipperer replicated the findings Wither and I reported in an earlier version of

our paper, but he contested our interpretation and conclusions.<sup>22</sup> Wither and I responded to Zipperer’s critiques with a series of additional analyses.<sup>23</sup> We leave interested readers to digest the details of this debate by reading the studies themselves.

A number of papers have analyzed state and local minimum wage changes enacted in recent years. In a widely discussed study by researchers at the University of Washington, administrative records from Washington State’s unemployment insurance system were used to analyze the effects of a recent series of increases in Seattle’s minimum wage.<sup>24</sup> The research team found evidence that hours worked by low-wage employees declined substantially in the wake of the series of increases. Indeed, the decrease for all these workers together was so large that their overall earnings declined slightly. Subsequent work by the Seattle team found evidence that employment fell only a little, if at all, for workers with prior experience in low-wage jobs.<sup>25</sup> This suggests that employment declined primarily because of reductions in hiring rather than increases in firing.

At this point, readers may be unsurprised to learn that the conclusions of the Seattle minimum wage study are in dispute. Most notably, the study’s initial findings were contested in a memo from Reich to the office of Seattle mayor Ed Murray.<sup>26</sup> This memo was complemented by critical analyses by Zipperer and John Schmitt, which were disseminated through the EPI.<sup>27</sup> In revisions to their analyses, the Seattle team has responded to several of the initial criticisms leveled against their work. Although they have only modestly revised their original conclusions, it is unclear what economists’ final verdict on this episode will be.

Many U.S. states have enacted substantial minimum wage changes in recent years. The early phases of these changes have been analyzed in a 2017 paper by Radha Gopalan, Barton Hamilton, Ankit Kalda, and David Sovich.<sup>28</sup> These authors analyze administrative employment records from Equifax, which allow them to track roughly one million hourly wage workers. Using data from 2011 through

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2015, they find that establishments that employ low-wage workers reduced employment following minimum wage increases. This occurred through reductions in hiring rather than layoffs of existing low-wage workers, which is consistent with the findings of the Seattle minimum wage study.

In additional research, Michael Strain and I are analyzing recent minimum wage changes using precommitted research designs.<sup>29</sup> That is, to avoid the pitfalls of data mining, we are reporting the results of analyses to which we committed after analyzing data that extended through 2015. Thus far, our estimates suggest that the effects of recent minimum wage changes have been highly varied. The largest of states’ minimum wage increases are negatively associated with employment among those in low-skilled groups. Further, the employment declines associated with large minimum wage changes have grown in magnitude as we have incorporated data from 2016, 2017, and 2018 into our analyses. In contrast, small changes have had modest and possibly positive relationships with employment.

Recent evidence points to important roles for subtle yet conventional labor market forces. That is, the evidence suggests that the dynamics of labor demand are crucial for understanding the minimum wage’s effects. During the Great Recession, for example, a combination of low demand and substantial churn may have set the stage for the relatively sharp effects of the 2007–2009 federal minimum wage increases on employment. In contrast, it may be the case that only large minimum wage changes have large enough effects on firms’ costs to alter their hiring during an economic expansion. When labor markets are tight, firms may effectively ignore small minimum wage increases, enabling such increases to have their intended effects on wages.

### Research from European Contexts

A number of recent papers have analyzed minimum wage changes using high-quality administrative data from European countries. Recent country-specific analyses examine

Denmark, Greece, Hungary, the Netherlands, Sweden, and Germany. While estimates vary substantially among these analyses, each case provides evidence that firms respond in traditional ways to increases in labor costs.

Claus Kreiner, Daniel Reck, and Peer Skov use Danish administrative data from 2012 to 2015 to analyze the employment effects of an age-specific increase in the minimum wage.<sup>30</sup> They find that the higher wage floor applicable to 18-year-olds substantially reduces their employment compared to 17-year-olds, for whom the wage floor is much lower. The employment drop is large enough to ensure that the total earnings of 18-year-olds are no greater than the total earnings of 17-year-olds, despite their higher wage floor.

Constantine Yannelis uses administrative employment records to analyze reductions in Greece’s minimum wage rates.<sup>31</sup> The minimum wage changes he analyzes were implemented in 2012 in accordance with International Monetary Fund bailout terms. These wage reductions were disproportionately large for young workers relative to older workers. Yannelis finds that these changes led firms to significantly increase their employment of young workers relative to older workers.

Peter Harasztosi and Attila Lindner analyze a large national minimum wage increase enacted by Hungary.<sup>32</sup> They use firms’ administrative tax filings to classify the extent to which each firm was affected and to track changes in firms’ employment over time. Harasztosi and Lindner conclude that roughly 1 in 10 workers affected by Hungary’s dramatic minimum wage increase lost employment. Because the wage increase was quite large, the wage bills of strongly affected firms increased substantially. In this setting, the authors find that the bulk of the minimum wage increase’s costs were borne by consumers through increases in prices.

Jan Kabatek looks at the Netherlands.<sup>33</sup> Like Denmark, this is a case of minimum wage rates that rise significantly with age. Using data that track individuals over time, Kabatek concludes that workers become substantially more likely to lose their jobs in the

two months prior to birthdays on which their minimum wage rises. He finds that these individuals gradually return to employment over subsequent months.

Emmanuel Saez, Benjamin Schoefer, and David Seim analyze Swedish payroll tax reductions implemented between 2007 and 2009.<sup>34</sup> These tax changes were meant to reduce the cost of young workers to firms. From the perspective of firms, the tax changes were economically similar to a reduction in negotiated wage rates. Using Swedish administrative records, which are renowned for their high quality, the authors found that these tax changes led to substantial increases in the employment of younger workers relative to older workers.

Finally, Marco Caliendo, Carsten Schröder, and Linda Wittbrodt summarize research, including their own work with Alexandra Fedorets and Malte Preuss, on the 2015 introduction of Germany's statutory minimum wage.<sup>35</sup> The German experience was novel because it involved a shift from collectively bargained wages to a statutory minimum wage floor, as opposed to an increase in an existing minimum wage. These authors conclude that the introduction of the minimum wage caused a small reduction in the number of low-wage jobs. Consistent with work on recent U.S. minimum wage changes, employment declines have come primarily through reductions in hiring rather than increases in firing. Among those individuals with jobs, reductions in hours were large enough to ensure that the monthly incomes of low-wage workers changed little.

### An Actual Experiment

A final piece of research that deserves emphasis is a 2018 paper by John Horton.<sup>36</sup> He analyzes an online labor market in which firms contract with workers for tasks including programming, data entry, and graphic design. In contrast with the papers discussed thus far, Horton identified an opportunity to deploy a randomized controlled trial to study the effects of minimum wage increases. As the designer of the study, he could impose

differences in firms' minimum wage requirements through random assignment. He finds that firms make significant shifts in the workers they employ when they are required to pay higher wages. In other words, they shift away from workers who are the least skilled and toward workers who demonstrate higher productivity on past jobs. High minimum wage rates thus reduce the employment opportunities of workers who are less productive.

### DOES THE EVIDENCE JUSTIFY THE SHIFT IN THE TRADITIONAL CONSENSUS?

Why has the consensus on minimum wages shifted? This is a difficult question, and any answer is necessarily speculative. In this section I discuss several issues that arguably are underappreciated by the new conventional wisdom.

#### Mistake 1: An Incomplete Reading of the Recent Research

The new conventional wisdom has to an unwarranted degree focused on the debate over the long history of minimum wage changes in the United States—that is, it has focused on the research discussed at the beginning of the previous section of this paper. It has focused less on other lines of research. In particular, it has focused less on recent research from European contexts, including Denmark, Germany, Greece, Hungary, the Netherlands, and Sweden, as well as on research that transparently analyzes compact historical episodes in the U.S. experience.

The emphasis of the new conventional wisdom is unfortunate because other lines of research have desirable features. In research on the effects of taxes, unemployment benefits, and other public policy initiatives, three attributes of studies have, with good reason, emerged as attributes toward which researchers strive. The first is a preference for data from individual-level administrative records over both aggregate data and survey data. The second is a preference for running experiments whenever possible. The third is an emphasis on

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implementing transparent research methods.

The research that forms the basis of the new conventional wisdom tends to lack all three of these attributes. Even when these studies' methods appear transparent and intuitive, opaque choices tend to determine both the sets of events that are studied and the comparisons underlying the estimates. In contrast, the research with which many audiences are less familiar includes truly randomized experiments and makes regular use of transparent methods and individual-level administrative records.

### Mistake 2: Shortcomings in the Application of Economic Thinking

In addition to taking a narrow view of the recent literature, the shifting consensus on the minimum wage has roots in several shortcomings in the application of basic economic ideas to real-world markets. The first involves discussions of labor market imperfections. The second involves the fact that there is more to a job than its wage. The third involves the time horizons over which firms can respond to changes in policy.

**CONCEPTIONS OF PERFECT COMPETITION VS. IMPERFECT COMPETITION.** In economic theory, the minimum wage's effects depend on how wages are set within labor markets. If a market is perfectly competitive, then pay aligns perfectly with a worker's productivity. Under perfect competition, a binding minimum wage is by definition a wage that exceeds some workers' productivity. In this framework, a binding minimum wage will inevitably cause some workers to be laid off by firms.

Contrast that with models of markets with imperfect competition. The key feature of these models is that market wages are suppressed relative to their perfectly competitive levels—that is, workers are paid less than the value of what they produce. Consequently, in these models it is possible for a minimum wage increase to improve workers' earnings without excluding them from employment. Firms are willing to pay a minimum wage that exceeds what they would otherwise have paid as long as

that wage does not exceed a given worker's productivity. In discussions of such models, “monopsony” and “frictions” are the jargon with which readers may be increasingly familiar.

The first chapter of Alan Manning's influential 2003 book *Monopsony in Motion* begins with the following thought experiment: What happens if an employer cuts the wage they pay their workers by one cent?<sup>37</sup> Because a penny is very small, the answer to this question is nothing. From this thought experiment, Manning concludes that “it is monopsony, not perfect competition, that is the best simple model to describe the decision problem facing an individual employer.”<sup>38</sup> This shift in framing is of great consequence. The textbook monopsony model is one in which a modest minimum wage can actually *increase* employment among low-skilled workers. It is a model in which the minimum wage can be used to combat inefficiencies linked to employer market power.

But the transition from the one-penny thought experiment to a monopsony-centric view of the labor market merits scrutiny. A model's importance stems from the power of its broad predictive and explanatory content, not from an illusory to-the-penny precision. Whether a competitive or monopsony-centric model is more useful depends on key details of both the labor market and the policy changes one is attempting to understand.

The practical implications of Manning's thought experiment hinge on the size of the frictions that give firms market power. Workers do not leave their employers over pennies; it costs more than pennies to find a new job. It is the cost of finding a new job that determines the power held by a worker's employer to set wages.

Both data and intuition suggest that employers wield only modest market power over low-skilled workers. One need only enter a mall, with its food court and retail outlets, to appreciate the large number of employers to which most low-wage workers can potentially apply. Real-world data concur; the value of the time it would take most minimum wage workers to find a competitive job offer is unlikely

to exceed \$1,000–\$2,000.<sup>39</sup> For full-time workers, these amounts are equivalent to \$0.50–\$1.00 in hourly pay. A wage differential of \$1 is thus far more likely to lead workers to seek new jobs than the penny from Manning’s thought experiment.

Real-world search costs appear to have quite modest implications for the market power employers can exert over workers in low-wage industries, such as food service and retail sales. The facts suggest that the monopsony framework may be useful for analyzing modest minimum wage increases from modest initial levels. But for large minimum wage changes, a model approaching the benchmark of perfect competition should be the more reliable guide.

**FRINGE BENEFITS AND OTHER ATTRIBUTES OF JOBS.** Many analyses of the minimum wage adopt a narrow view of relationships between workers and employers. Specifically, they simplify the relationship to two factors: wages and employment. In analyses of this sort, the minimum wage’s effect on a worker’s well-being is deceptively simple. If the wage rises and the worker remains employed, naïve models imply that the worker is necessarily better off.

But in practice, when we negotiate with our employers, we appreciate that jobs have many subtle but important characteristics. Work hours can be at the convenience of the worker or at the convenience of the firm. The pace of work can be fast or slow, safer or riskier, and can require more or less mental energy. Compensation can either include or exclude health insurance, retirement contributions, and other benefits. A job’s location can be more or less preferable, and opportunities for advancement (within or outside the firm) can be more or less ample.

All these factors affect both workers’ well-being and firms’ bottom lines. Most minimum wage commentary sweeps these factors under the rug, but nuanced models recognize that they are central for understanding the minimum wage’s effects. Adjustments to nonwage factors are among the most obvious and inexpensive adjustments a firm can make. Reducing noncash compensation and requiring

increases in a worker’s effort are straightforward ways for employers to align costs and revenues following minimum wage increases. Crucially, actions along these margins will tend to offset any wage increase’s effects on a worker’s well-being. Because these factors are often unmeasured, our awareness of their importance makes it appropriate to embrace humility regarding the strength of the conclusions we can draw from available data.

Economists have long been aware that a job’s nonwage characteristics can be central to its value to workers. In a 1986 chapter from the *Handbook of Labor Economics*, Sherwin Rosen observes that the framework of “compensating wage differentials” has been with the economics profession since Adam Smith’s *The Wealth of Nations*.<sup>40</sup> There has recently been a wave of high-quality research on this theme. Several recent papers highlight the value of worker-driven schedules.<sup>41</sup> One paper by Nicole Maestas, Kathleen Mullen, David Powell, and others finds that workers are willing to pay substantially for improvements in workplace conditions.<sup>42</sup> Complementary research by Isaac Sorkin finds that nonwage aspects of jobs account for a large fraction of total variation in workers’ valuations of jobs among different firms.<sup>43</sup>

Despite the obvious importance of nonwage factors, research on the extent to which these factors are affected by minimum wage increases is quite limited. Because of data limitations, the primary nonwage factor that can be incorporated into minimum wage studies is whether workers have employer-provided health insurance (EPHI). Analyses of historical minimum wage changes tend to find weak evidence of a relationship between minimum wage increases and EPHI. In contrast, analyses of more recent minimum wage changes tend to find negative effects.<sup>44</sup> On a qualitatively different but important margin, papers by Hyejin Ku and by Decio Coviello, Erika Deserranno, and Nicola Persico find that low-productivity workers increase their work effort in the wake of minimum wage increases.<sup>45</sup> But little if any evidence exists on a rich set of

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potentially important margins, including the flexibility of work schedules.

**DYNAMICS.** When estimating the effects of minimum wage increases, economists struggle to capture subtleties in the timing with which firms might respond. An example involving the payment-processing technologies in which fast-food chains can invest illustrates several points.

Fast-food chains can choose either employee-operated cash registers or automated kiosks. An important aspect of this choice is that it involves upfront investments in equipment that may depreciate gradually over many years. For new firms, high minimum wages may tip the cost calculation in favor of automated kiosks. New entrants to the fast-food market may thus adopt less labor-intensive business models soon after high minimum wages go into effect. But for continuing firms, the calculation may be quite different. This will be particularly true for those that made investments in standard cash registers prior to a minimum wage increase's passage. If the minimum wage rises modestly, such firms may continue operating with cash registers until their equipment requires replacement. Consequently, their response to a minimum wage increase might not occur until years after the change has gone into effect. This difference between new entrants and continuing firms highlights that a minimum wage change's overall effects may unfold gradually.

Economists have little evidence on how firms adjust their capital investments in response to changes in minimum wages. Efforts to study firms' production technologies have to date been indirect. For example, recent studies by Dan Aaronson and Brian Phelan and by Grace Lordon and David Neumark find that minimum wage increases predict declines in employment among workers in occupations whose tasks are readily replaced with technology.<sup>46</sup> Related analyses emphasize the productivity of the workers within each occupation. In his randomized experiment in an online labor market, John Horton finds evidence that firms shift from lower-productivity workers toward higher-productivity workers. Lisa

Kahn, Jonathan Meer, and I similarly find that recent increases in states' minimum wages predict increases in the average age and education of workers in low-wage occupations.<sup>47</sup>

Minimum wage changes often come with long lags between the dates when they are legislated and the dates when they are implemented. In an analysis of recent legislative histories, Duncan Hobbs, Michael Strain, and I find that recent state-initiated minimum wage increases had lags averaging six months between the date of their passage and the date a first increase was implemented.<sup>48</sup> Lags between the date of legislation and the final date of multistep increases are much longer.

Empirical methods in the minimum wage literature account poorly for lags between legislative activity and implementation. When an increase is signed into law, forward-thinking firms know to take cost implications into account. Some firms may thus change their technologies before a minimum wage increase goes into effect. Firms' forward-looking responses undermine the ways many economists deploy statistical tests to estimate a minimum wage change's effects. When estimating those effects, economists worry that their estimates will be biased if the labor markets in states that enact minimum wage increases were trending differently than the labor markets in other states. Unfortunately, these differential trends cannot easily be distinguished from forward-looking responses of firms. The standard practice in recent research has been to lump these phenomena together—that is, forward-looking responses have been conflated with “divergent pre-existing trends.” In turn, they are assumed to be evidence that estimates are likely to be biased. Standard practice thus biases researchers against detecting negative effects of minimum wage increases on employment.

Although this bias remains pervasive in recent minimum wage research, its relevance has been recognized for quite some time. The implications of investments by forward-looking firms were developed in papers by Sorkin and by Aaronson, Eric French, Sorkin, and Ted To.<sup>49</sup> A key empirical aspect of these

insights was highlighted in work by Jonathan Meer and Jeremy West,<sup>50</sup> who show that common techniques for accounting for “divergent trends” may in fact bias analyses toward incorrectly concluding that minimum wages have no effect on employment. These authors show that in some cases this bias can be resolved by analyzing employment growth rather than employment levels. Although Cengiz, Dube, Lindner, and Zipperer have recently criticized the empirical analysis of Meer and West, the theoretical thread connecting the analyses of Meer and West to those of Aaronson, French, Sorkin, and To is unchallenged. The key conceptual point is strongly intuitive and appears to be well founded.

## **CONCLUSION: WHERE DO WE GO FROM HERE?**

The “Fight for \$15” has shifted from the advocacy fringes to the political mainstream. News media increasingly report that a \$15 federal minimum wage would benefit low-skilled workers at little cost. This essay pushes against that shift on several grounds: the new conventional wisdom’s reading of recent evidence is incomplete, its grounding in theory is far

more limited than its supporters let on, and it ignores significant blind spots in economists’ empirical methods.

Because \$15 wage floors have been narrowly and only recently applied, there is no evidence to support the sweeping claim that a \$15 federal minimum wage would benefit disadvantaged households at little cost. This is particularly true when we consider regions where low housing and labor costs support the social and labor market integration of both immigrants and low-skilled native-born workers. More than doubling the minimum wage, from \$7.25 to \$15.00, risks radically altering the entry-level opportunities on which these individuals rely.

Recent minimum wage changes have been substantial, with scheduled increases approaching 70 percent of the initial minimum wage in several states. Large differences in states’ minimum wage policies have now been sustained for several years. Recent experience may thus provide the best opportunity in decades to learn about the medium-run effects of substantial minimum wage changes. As data on recent labor market developments pour in, the next several years will be an exciting time for both minimum wage research and minimum wage researchers.

“Because \$15 wage floors have been narrowly and only recently applied, there is no evidence to support the sweeping claim that a \$15 federal minimum wage would benefit disadvantaged households at little cost.”

**NOTES:**

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