



A Review of the Independent Fiscal Office's 2019 Minimum Wage Analysis

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Executive Summary

The March 2019 analysis by the Independent Fiscal Office¹ of the Wolf Administration's proposal to raise the minimum wage to \$12 per hour this July is broadly positive and consistent with other estimates of the impacts of minimum wage increases. Specifically:

- The IFO finds that a minimum wage increase to \$12 per hour this July will raise wages for 1.9 million workers, with 1.1 million workers benefiting directly as they currently earn less than \$12 per hour, and another 800 thousand workers currently earning between \$12 and \$15 per hour benefiting indirectly.
- Among the 1.1 million workers directly affected by a minimum wage increase the IFO estimates average annual incomes will rise by \$2,470.
- In total the IFO estimates that Pennsylvania incomes will rise by \$3.5 billion boosting Pennsylvania General Fund revenues by \$50 million. Setting aside the IFO's questionable assumptions regarding employment and hours reductions associated with minimum wage increases boosts IFO estimates of wage increases to \$4.5 billion and General Fund revenue increases to \$64 million.
- In terms of demographics of the workers affected the IFO finds:
 - The vast majority (88.4%) of workers that would be affected by a minimum wage increase are adults age 20 or older,
 - with just over 41.5% age 40 and older.
 - A little over half (56.2%) are women.
 - Just over one in four (25.9%) are parents.
 - Just over half (56.3%) are employed full time.
- The IFO, consistent with its last four minimum wage analyses, speculates that 34,000 workers would lose employment as a result of a minimum wage increase to \$12 this July. This is a small number relative to those who benefit—less than 2% of the number the IFO predicts will see higher wages. In addition, the IFO has expanded the scope of its literature review on the relationship between state-level minimum wage increases and employment to include research that finds minimum wage increases have not had negative employment effects. Yet the IFO continues to assume a small amount of employment loss, an assumption out of step with the most current and sophisticated

¹ Independent Fiscal Office. Mar 2019. "Analysis of revenue proposals in the FY 2019-20 executive budget." <http://www.ifo.state.pa.us/releases.cfm?id=261>

research using the strongest research designs (i.e., the best controls for other variables that impact employment, more precisely isolating and estimating employment effects of minimum wage increases).

- The IFO’s estimates of the number of workers who will benefit and of income increases are broadly consistent with those derived from the Economic Policy Institute’s Minimum Wage Simulation Model (MWSM), which finds a minimum wage of \$12 this July will raise wages for 1.6 million workers, boosting total income by \$5.3 billion.
- While the IFO chooses not to estimate the impacts of a \$15 per hour minimum wage by 2025, the EPI model projects that about \$2 million workers would benefit from this change, a third of Pennsylvania’s workforce.
- The IFO does not estimate employment impacts from increasing the tipped minimum wage to \$12 per hour. The IFO cites one recent statistic on employment trends in full-service restaurants—those most likely to employed tipped workers—in New York City. A more careful study of full-service restaurants in New York (which has increased the tipped minimum wage) and neighboring states (which have not) finds faster growth in employment, wages, and the number of business establishments in New York. Industry growth has been especially strong in New York counties that border Pennsylvania relative to the neighboring Pennsylvania counties.
- Data on the broader food services and drinking places industry (which includes fast food and bars as well as full-service restaurants) in Pennsylvania and surrounding states—all of which have increased their minimum wage since 2010—also show more robust employment and wage growth in other states than Pennsylvania.

Introduction

In what follows we review estimates published by the Independent Fiscal Office (IFO) of the number of workers affected, their demographics and the change in their income from a minimum wage increase to \$12 this July. We present alongside the IFO’s estimates our estimates derived from the Economic Policy Institute’s Minimum Wage Simulation Model.²

Workers Affected

Table 1.

The number of affected workers and the change in income from a minimum wage increase to \$15

	Employment (1000s)		Income (millions)	
	IFO	EPI	IFO	EPI
Directly Affected	1,110	1,132	\$2,743	\$4,817
Indirectly Affected	827	536	\$766	\$544
Total Affected	1,937	1,668	\$3,510	\$5,361

² David Cooper, Zane Mokhiber, and Ben Zipperer. 2019. “Minimum Wage Simulation Model technical methodology.” Economic Policy Institute <https://www.epi.org/publication/minimum-wage-simulation-model-technical-methodology/>

Table 1 presents side by side estimates of (a) the number of workers affected by a minimum wage increase to \$12 per hour in July 2019 and (b) the resulting increase in income generated by the IFO and by the Minimum Wage Simulation Model (MWSM). Broadly the two estimates are similar, with the IFO predicting 1.9 workers would be affected and the MWSM estimating 1.6 million workers. The IFO predicts total income would rise by \$3.5 billion while the MWSM predicts an increase of \$5.3 billion (Table 1).

Source: Keystone Research Center based on the Independent Fiscal Office and the Economic Policy Institute's Minimum Wage Simulation Model.

Table 2 identifies the major differences between the two estimates: these differences center around assumptions made in calculating workers indirectly affected by a minimum wage increase, and in estimating the increase in annual income.³

Minimum wage increases are expected to alter the earnings of workers earning just above the new higher minimum wage as employers are compelled to raise wages for workers that were originally above the minimum wage but are now at or much nearer the new higher minimum wage. These workers are identified as indirectly affected workers. The IFO defines workers indirectly affected as those earning between \$12 per hour and \$14.99 whereas the MWSM defines indirectly affected workers more narrowly, as those earning between \$12 and \$13.80 per hour (i.e., up to 115% of a minimum wage of \$12). The IFO's assumption of a wider band of earnings indirectly affected by a minimum wage increase results in a larger count, 827 thousand versus the MWSM's estimate of 536 thousand.

Table 2.

Major Differences in Assumptions between the IFO and Minimum Wage Simulation Model estimates (MWSM)

	IFO	MWSM
1) Definition of Indirectly Affected	Workers earning between \$12 and \$14.99	Workers earning between \$12 and \$13.80
2) Calculating the increase in income	Assumes 1) a loss of 34,000 jobs; 2) part time and full-time workers earning less than \$11 per hour will work 25 fewer hours this year; 3) part-time workers work 20 hours a week for 50 weeks and full-time work 40 hours a week for 50 weeks.	Assumes 1) no job loss; 2) no hours reduction; and 3) calculates the increase in income by multiplying usual hours worked as reported in the Current Population Survey by 52 weeks.

Source: Keystone Research Center based on the Independent Fiscal Office and the Economic Policy Institute's Minimum Wage Simulation Model.

The IFO in calculating the change in income from a minimum wage increase assumes:

³ There are numerous smaller differences in assumptions including the treatment of workers in the Current Population Survey reporting hourly earnings less than \$7.25; the growth in wages (as reported in the 2018 Current Population Survey) by 2019; and the imputation of missing hourly earnings and or/hours of work. While important, these smaller differences do not lead to large material differences in the two sets of estimates.

1. the loss of 34,000 jobs;⁴
2. a reduction in annual total hours worked of 25 hours for part time and full-time workers;
3. a 50-week year;
4. part time workers work 20 hours a week and full-time workers work 40 hours a week.

EPI's Minimum Wage Simulation Model in contrast assumes:

1. no job loss;
2. no reduction in hours worked;
3. a 52-week year;
4. workers work each week the "usual hours worked" reported in the household survey.

The IFO and EPI assumptions about job loss reflect different judgements about the most relevant findings in the academic literature about the observed relationship between minimum wage increases and the employment of low-wage workers.⁵ We discuss these differences in more detail in the next section. The IFO assumption of a reduction in hours worked is based on a paper from a team of researchers at the University of Washington which is plagued by a number of methodological issues and therefore its results are not incorporated into EPI's Minimum Wage Simulation Model.⁶ The IFO assumes a 50-week year while EPI assumes a 52-week year. Finally, the IFO assumes part time employees work 20 hours per week and full-time employees 40 hour. The EPI model relies on estimates of usual hours worked (per week) by affected workers as reported in the Current Population Survey in 2018, which turn out to be 20 hours for part-time workers and 41 for full-time workers it was 41 hours. In sum, the differences in annual earnings resulting from differences in the treatment of hours are trivially small.

Using the IFO's published tables, if we eliminate the IFO job-loss and hours-reduction assumptions, and increase weeks worked to 52, the total income increase using the rest of the IFO's assumptions equal \$4.5 billion (raising the state revenue gain to \$64 million).⁷ This leaves a difference of about \$800 million (or 16%) between the two estimates.⁸

It is also worth underscoring that the IFO, like EPI—and consistent with recent research literature (see Box A)—finds that expected gains in income for employed workers will far exceed losses in income because of job losses or hours reductions. Further, there is also a lot of churn in low-wage labor markets—although there will be less after the minimum wage rises—so any

⁴ In its previous four reports on the impact of a minimum wage increase, the IFO assumed that workers displaced by a minimum wage increase remain jobless for an entire year and subtracted this annual income from the total aggregate change in income. This year, the IFO simply estimates the increase in income for workers not displaced.

⁵ In the academic literature this relationship is referred to as an employment elasticity. The Congressional Budget Office in its 2014 analysis converts elasticities into response parameters, specifically an elasticity of $-.10$ for all teen employment is converted into a response parameter of $-.045$ implying each 10% increase in the minimum wage will reduce teen employment among directly affected teens by 4.5%.

⁶ Ben Zipperer. 2018. "Six reasons not to put too much weight on the new study of Seattle's minimum wage" Economic Policy Institute. <https://www.epi.org/blog/six-reasons-not-to-put-too-much-weight-on-the-new-study-of-seattles-minimum-wage/>

⁷ Here we are assuming the IFO's estimate of higher tax revenue would remain 1.4% of the total increase in wages.

⁸ This remaining difference will likely be explained by some combination of differences in assumptions about hours worked and differences in assumptions about the resulting wage changes for indirectly affected workers.

particular worker who leaves one employer, for whatever reason, will likely be able to find another job that now pays more than they were making before the minimum wage increase.

Box A: The Most Current Research Confirms That Minimum Wage Increases Raise Individual and Family Incomes

Dube (2018) finds minimum wage increases raise family incomes at the bottom of the income distribution and Rinz and Voorheis (2018) observe positive effects on individual earnings that grow in magnitude up to five years after a minimum wage increase.

This research is particularly important because potential dis-employment effects, which the IFO emphasizes, would operate both through job loss and reductions in hours of work if actually present. The findings in both the new studies indicate that any dis-employment effects are not large enough to reduce the earnings of low-wage workers or their families. Both Dube (2018) and Rinz and Voorheis (2018) find the incomes of the bottom 20% of low-wage families unambiguously increased after minimum wage increases.

Arindrajit Dube, 2018. "Minimum Wages and the Distribution of Family Incomes." American Economic Journal – Applied, forthcoming. <http://ftp.iza.org/dp10572.pdf>

Kevin Rinz and John Voorheis. 2018. "The Distributional Effects of Minimum Wage Increase: Evidence from Linked Survey and Administrative Data." U.S. Census CARRA Working Paper 2018-2. <https://www.census.gov/content/dam/Census/library/working->

In Table 3 we turn our attention to the limited demographic data that the IFO presents and compare that to estimates based on the MWSM. The demographic characteristics of the workers affected are broadly consistent: both approaches find affected workers are majority female, at least 88% adult, majority full-time, and roughly one in four are parents

Table 3.

Comparing the demographic characteristics of workers affected by a \$12 minimum wage according to the Independent Fiscal Office and the Economic Policy Institute's Minimum Wage Simulation Model.

Category	IFO			MWSM		
	Total affected (thousands)	Share of group who are affected	Group's share of state total affected	Total affected (thousands)	Share of group who are affected	Group's share of state total affected
Total	1,937	34%	100%	1,668	29%	100%
Sex						
Women	1,089	39%	56%	1,019	35%	61%
Men	849	29%	44%	649	22%	39%
Age						
20 +	1,713	36%	88%	1,497	27%	90%
Under 20	224	98%	12%	171	78%	10%
Age Detailed						
16 to 24	575	74%	30%	561	73%	34%
25 to 39	558	31%	29%	506	28%	30%
40 +	804	33%	42%	601	18%	36%
Family Status						
Married parent	323	24%	17%	202	15%	12%
Single parent	178	46%	9%	204	42%	12%
Married, no kids	377	25%	19%	288	18%	17%
Unmarried, no kids	1,061	49%	55%	975	42%	58%
Work Hours						
Part time (< 20 hours)	846	67%	44%	243	59%	15%
Mid time (20-34 hours)				543	63%	33%
Full time (35+ hours)	1091	24%	56%	883	19%	53%

Source: Keystone Research Center based on the Independent Fiscal Office and Economic Policy Institute's Minimum Wage Simulation Model

The Responsiveness of Low-Wage Employment to Wage Increases

The Independent Fiscal Office (IFO) has released five evaluations of the effects of proposals to raise the minimum wage since 2015.⁹ These evaluations have been for a minimum wage increase to \$10.10 in 2015, \$10.15 in 2016, and \$12 in 2017, 2018 and 2019. The IFO has consistently estimated that about a million workers would be affected by a minimum wage increase directly with about 3% of that total projected to lose employment (Table 4).

Table 4.

⁹ Independent Fiscal Office. Nov 2015. "Raising the Minimum Wage in Pennsylvania." <http://www.ifo.state.pa.us/releases.cfm?id=18>; Independent Fiscal Office. Apr 2016. "Analysis of revenue proposals in the FY 2016-17 executive budget." <http://www.ifo.state.pa.us/releases.cfm?id=48>; Independent Fiscal Office. Apr 2017. "Analysis of revenue proposals in the FY 2017-18 executive budget." <http://www.ifo.state.pa.us/releases.cfm?id=123>; Independent Fiscal Office. Apr 2018. "Analysis of revenue proposals in the FY 2018-19 executive budget." <http://www.ifo.state.pa.us/releases.cfm?id=198>; Independent Fiscal Office. Mar 2019. "Analysis of revenue proposals in the FY 2019-20 executive budget." <http://www.ifo.state.pa.us/releases.cfm?id=261>

Summary of the Independent Fiscal Office's (IFO's) Five Minimum Wage Estimates Completed Since November 2015

IFO Publication Date	New Minimum Wage	Number of Workers (thousands)			
		Directly Affected	Indirectly Affected	Total Affected	Estimated Job Losses
Nov 2015	\$10.10	1,055	NA	1,055	31
Apr 2016	\$10.15	1,023	NA	1,023	30
Apr 2017	\$12.00	1,342	NA	1,342	54
Apr 2018	\$12.00	1,025	NA	1,025	33
Mar 2019	\$12.00	1,110	827	1,937	34

Notes: (NA) The IFO did not estimate indirectly affected wages in its four-analyses completed prior to 2019.

Source: Keystone Research Center based on the Independent Fiscal Office

The consistency of these employment estimates stems from the fact that the IFO's analysis has relied on the same assumptions about the responsiveness of low-wage employment to minimum wage increases or what the IFO calls "response parameters" in its five reports released between 2015 and 2019. For example, a response parameter of -0.45 for teenagers implies each 10% increase in the minimum wage will reduce directly affected teen employment by 4.5%. In its first two reports (2015/2016) the IFO presented response parameters by age (teens versus adults). In the last three reports (2017/2018/2019) the IFO switched to reporting response parameters by wage level. Although the presentation of response parameters has changed the underlying assumption about how much employment will change in response to higher wages has not.

In the IFO's first minimum wage report from November 2015, relying on the Congressional Budget Office, the IFO assumed that each 10% increase in wages reduced teen employment by 4.5%.¹⁰ For adults, also following the CBO (and arbitrarily), the IFO reduced the teen response parameter by two-thirds, assuming a 10% increase in the minimum wage would reduce employment of directly affected adults by 1.5%. In Appendix A, we show in more detail how the IFO continued to base its employment estimates on the CBO 2014 report including in its most recent report from this March. That is, the IFO continues to rely on research focused on teens to estimate job loss in a workforce that by its own estimates is 88% adults.

The IFO's most recent report (2019) does include one significant improvement—an expanded literature review. That literature review acknowledges a growing body of research that has response parameters approaching or at zero. In particular, the IFO includes a summary of a forthcoming Quarterly Journal of Economics paper by Cengiz, Dube, Linder, and Zipperer (CDLZ) that directly examines the link between minimum wage increases and employment for the entire low-wage workforce after 138 state-level minimum wage increases.¹¹ MIT economist David Autor¹² has called this paper the most important work on minimum wage effects since Card and Kruger's seminal minimum wage paper studying the effects of a minimum wage

¹⁰ U.S. Congressional Budget Office. 2014. "The Effects of a Minimum-Wage Increase on Employment and Family Income."

¹¹ Doruk Cengiz, Arindrajit Dube, Attila Lindner, and Ben Zipperer. 2018. "The Effect of Minimum Wages on Low-Wage Jobs: Evidence from the United States Using a Bunching Estimator." LSE Center for Economic Performance Discussion Paper 1531. <http://cep.lse.ac.uk/pubs/download/dp1531.pdf> see also <https://www.nber.org/papers/w25434>

¹² <https://twitter.com/mioana/status/949651997917175808>

increase in New Jersey on fast employment (compared to Pennsylvania where the minimum wage didn't change).¹³ Consistent with Card and Krueger's study CDLZ found no dis-employment effects associated with minimum wage increase implemented across the country. The IFO justifies its decision not to rely on CDLZ for its response parameters because a minimum wage increase to \$12 this July will be a larger increase relative to the statewide median wage than was typical in the sample studied by CDLZ. The fact that a proposed increase to \$12 this July in the minimum wage will impact a larger group of workers than most previous minimum wage increases that have been studied only introduces uncertainty as to the potential employment effects; it does not imply that the IFO should continue to rely on the same response parameters they have since 2015. An alternative would have been to acknowledge that no dis-employment effect is also in the range of potential outcomes.

Cengiz (2018) also finds that extrapolating from research on teenagers to all low-wage workers can lead to employment estimates that are overstated.¹⁴ Much of the disagreement in the economic literature is focused on the employment impacts on teenagers, a group that represents less than 12% of affected workers in the IFO's estimates. Unlike the literature on teenagers, Cengiz notes that the research literature focused on adults finds employment effects that are close to zero. By extrapolating from teen response parameters to adults, the IFO's estimates overstate the potential job loss associated with minimum wage increases.

Two final issues raised by the IFO relate to the increase in the proposed minimum wage relative to the median wage and the size of the proposed minimum wage increase, including for tipped workers. On the first issue, we project a minimum wage of \$12 will be 49% of the median wage for full-time full-year workers in Pennsylvania in 2019. In 1968, the minimum wage was 51% of the median wage for full-time full-year workers in Pennsylvania.¹⁵ Thus, while we agree with the IFO that a \$12 minimum wage this July will be higher relative to the median wage than in recent years, it is not high relative to 1968.

On the second issue, the size of the minimum wage increase, including for tipped workers, one natural experiment with such large increases took place in the 1960s. The 1966 Fair Labor Standards Act phased in an extension of the minimum wage to workers in restaurants, nursing homes and other service sector jobs, which at that time employed over a third of all black workers in the U.S.¹⁶ In 1967, Derenoncourt and Montialoux (2018) find that the federal minimum wage went from 0% to 38% of the median wage in the newly covered industries and

¹³ David Card and Alan B. Krueger, 1994. "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania" *American Economic Review*. <http://davidcard.berkeley.edu/papers/njmin-aer.pdf>

¹⁴ Doruk Cengiz. 2018. "Seeing Beyond the Trees: Using machine learning to estimate the impact of minimum wages on affected individuals." Job market paper. https://www.dropbox.com/s/yjnosg503wkm6py/cengiz_seeing_beyond_the_trees.pdf

¹⁵ We rely on median wages for full-time full-year workers because this figure is available back to 1968 whereas median wages for all workers are not available. The median wage for full-time full-year workers is higher than the median wage for all workers because part-time workers tends to earn less than full time one. Our estimates of median wages for full-time full-year in Pennsylvania are based on Economic Policy Institute analysis of data from the March supplement Current Population Survey. We impute the median wage full-time full-year wage in 1968 in Pennsylvania assuming the wage was 102% of the U.S. median wage full-time full-year wage of \$3.07. The median in Pennsylvania averaged 102% of the U.S. wage from 1976 to 1979. Over the whole period (1976 to 2015) the Pennsylvania median averaged 103% of the U.S. median.

¹⁶ Ellora Derenoncourt and Claire Montialoux, "Minimum Wages and Racial Inequality," Mimeograph, November 30, 2018. http://clairemontialoux.com/files/montialoux_jmp_2018.pdf

affected workers in these industries received a 34% wage increase on average. Even though employers in affected sectors like restaurants absorbed a relatively large increase in labor costs, Derenoncourt and Montialoux find no significant dis-employment effects including for black workers. They also find that the minimum wage accounts for 20% of the reduction in the black-white earnings gap in the Civil Rights Era from 1954 to 1968. This research has particular relevance to the Wolf Administration's proposal to raise the tipped minimum wage from \$2.83 to \$12 this July—to the benefit of the mostly female tipped labor force—because it shows that it is not unprecedented for large changes in the minimum wage to have positive effects on earnings without reducing employment.

Box A: The Credibility Revolution in Empirical Economics

David Card and Alan B. Krueger's analysis of a New Jersey minimum wage increase in 1990 is a seminal paper in a body of research sometimes referred to as the credibility revolution in empirical economics. Due to this revolution, improved research designs have improved the accuracy and replicability of statistical (or "econometric") analysis in economics.

Card and Krueger conducted a phone survey of fast-food restaurants in neighboring parts of Pennsylvania and New Jersey, just across the border from each other and with similar economic environments. Using neighboring Pennsylvania fast food restaurants as a "control group" enabled the researchers to attribute any difference in fast food employment growth in New Jersey to the minimum wage increase. They found no difference in fast food job growth between the two states.

This research drew attacks from conservative critics financed by and relying on data manipulated by a restaurant industry think tank.² Krueger and his co-author obtained administrative payroll data from New Jersey and Pennsylvania and confirmed their original findings.

Since the original Card and Krueger study, its basic approach has been replicated on a larger scale with better data.³ One 2010 study compared neighboring counties along every state border in the country, capitalizing on the many cases of one state increasing a minimum wage while another one didn't.⁴ The authors found that a higher minimum wage had a positive effect on employment (albeit a small one that researchers could not be confident was bigger than zero). Last year, a controlled natural experiment study of six cities on their way to \$15 per hour found that wages increased nearly 2% for each 10% increase in the minimum wage. Meanwhile, employment was essentially unchanged.⁵

¹ David Card and Alan B. Krueger, "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania," *American Economic Review*, 84(4), (September 1994), pp. 772-793; <http://davidcard.berkeley.edu/papers/njmin-aer.pdf>

² John Schmitt, 1996. "Behind the Numbers: Cooked to Order". *The American Prospect*. <http://cepr.net/publications/op-eds-columns/behind-the-numbers-cooked-to-order>

³ Daniel Kuehn, 2014. "The Importance of Study Design in the Minimum-Wage Debate" *Economic Policy Institute*. <https://www.epi.org/publication/importance-study-design-minimum-wage-debate/>

⁴ Arindrajit Dube, T. William Lester, and Michael Reich. 2010. "Minimum Wage Effects Across State Borders: Estimates Using Contiguous Counties" *Institute for Research on Labor and Employment, University of California, Berkeley*. <http://irle.berkeley.edu/files/2010/Minimum-Wage-Effects-Across-State-Borders.pdf>

⁵ Sylvia Allegretto, Anna Godoey, Carl Nadler and Michael Reich. 2018. "The New Wave of Local Minimum Wage Policies: Evidence from Six Cities" *Center on Wage and Employment Dynamics, University of California, Berkeley*. <http://irle.berkeley.edu/files/2018/09/The-New-Wave-of-Local-Minimum-Wage-Policies.pdf>

Tipped Workers and Employment Trends in Food Services

In Pennsylvania, employers of workers that customarily receive tips are only required to pay their tipped workers a base wage of \$2.83 per hour, provided their workers' weekly income from tips plus their base pay at \$2.83 brings their hourly rate to \$7.25. Even after factoring in tips, tipped workers in states like Pennsylvania earn 11% less than tipped workers in states like

Alaska, California, Hawaii, Minnesota, Montana, Oregon and Washington State where there is no separate and lower tipped minimum wage.¹⁷

Governor Wolf has proposed eliminating the tipped minimum wage as the minimum wage is raised to \$12 this July. The IFO estimates there are a total of 195,000 tipped workers in Pennsylvania with 132,000 of those workers earning less than \$12 per hour.¹⁸ According to the Economic Policy Institute's Minimum Wage Simulation Model a minimum wage increase to \$12 per hour this July would raise wages in total for 170,000 tipped workers with 123,000 of those directly affected (earning less than \$12 per hour).

In its analysis (on p. 36), "The IFO did not perform a formal analysis for the increase in cash wages for tipped workers from \$2.83 to \$12.00 per hour (324 percent) because no research exists on which to model the proposed change." The IFO does observe that preliminary employment data for full-service restaurants declined by 4% from May 2018 to January 2019, a period imperfectly match to tipped minimum wage increases from \$7.50 per hour in 2017 to \$8.65 in 2018 and \$10.00 in 2019. The IFO then adds four different disclaimers (p. 37) that amount to telling readers not to put any stock in this employment decline.¹⁹ We think the IFO is right in this assessment. Moreover, an October 2018 study of employment trends in New York full-service restaurants from 2015 to 2017—when New York increased its tipped minimum wage from \$5 to \$7.50—found more robust growth in employment, total wages, average wages, and the number of establishments in New York border counties than in the border counties of neighboring states that did not increase their minimum wage.²⁰

Since every neighboring state around Pennsylvania has increased its state minimum wage in recent years, the food services and drinking places sector (NAICS 772; <https://www.bls.gov/iag/tgs/iag722.htm>) also offers another source of evidence on employment and wage trends in a low-wage industry that includes many tipped workers. The most reliable employment data for small areas is the Quarterly Census of Employment and Wages (QCEW), only available with a long lag (i.e., up until part way through 2018 currently). We examine the change in both wages and employment in the QCEW from 2012-13 to 2017-18 for Food Services and Drinking Places across our entire region seven-state region (Pennsylvania, six neighbors, and Washington DC). By focusing on this employment series that contains both limited and full-service restaurants we are examining a larger sector and therefore are more likely to observe

¹⁷ Economic Policy Institute analysis of Current Population Survey Outgoing Rotation Group microdata, 2014-2016 <https://www.epi.org/blog/valentines-day-is-better-on-the-west-coast-at-least-for-restaurant-servers/>

¹⁸ The IFO also estimates based on the difference in reported employment in a survey of establishments (Current Employment Statistics) compared to the household survey that there are another 100 thousand part-time tipped workers in what it defines as secondary jobs. Given this estimate is back of the envelop calculation there is no data on earnings for these workers. In its main analysis the IFO imputes wage data for these jobs by assuming they have the characteristics of part time workers in the CPS, however in analyzing tipped workers the IFO chooses not to make a similar imputation.

¹⁹ The four disclaimers: the data is preliminary, year-over-year comparisons (which the IFO does not actually show) are not a "true counterfactual" (e.g., a statistical model with control variables), that any results from New York City (or another city, such as Seattle) will not translate to Pennsylvania, and that limited-service (fast food) restaurants enjoyed solid employment gains in New York in 2018 despite a minimum wage increase from \$12 to \$13.50.

²⁰ Institute for Policy Studies and Restaurant Opportunities Centers United, "New York's Experience after the Tipped Minimum Wage Increase: Restaurant worker wages, employment, and number of establishments have grown in the past two years," October 2019; <https://inequality.org/wp-content/uploads/2018/11/New-York-tipped-minimum-policy-brief-Oct-2018.pdf>

employment in this sector even in the smallest counties across the region. As noted, New York increased its tipped minimum wage and its overall minimum wage. Other neighbors did not increase their tipped minimum wage, but overall minimum wage increases likely pushed up wages for all lower-wage workers in this sector, tipped and non-tipped.

We find, that wage growth in food services has been stronger in the rest of our region where the minimum wage has increased (Table 5). We also find that employment growth has been greater in the rest of our region than in Pennsylvania. Notably in New York State where the minimum wage increased in real terms by at least 29% over the period of our analysis (more in New York City) both employment and wage growth were relatively stronger than in most of the region. Through the entire region as the real purchasing power of the minimum wage rose by 15.9%, payroll growth in food services was up 13.3% compared to the much slower growth of 8.2% in Pennsylvania where the purchasing power of the wages paid to minimum wage workers fell 6.9%.

Map 1 and Map 2 on the next page repeat this analysis at the county level. One key difference between the maps and our analysis in Table 5 is that in the maps we limit our analysis to the change in employment and average weekly wages between 2012 and 2017 in order to maximize the number of counties for which we have data.²¹

²¹ Non-disclosure of data to protect confidentiality limits the availability of employment and average weekly wages for some small-population counties to annual averages. Our analysis in Table 1 relies on quarterly data. The last full year of data available in our data source, the Quarterly Census of Employment and Wages, is 2017.

Table 5.

Percent change in weekly wages and the minimum wage (both adjusted for inflation [2017-18 \$]) and employment, all industries and food service and drinking places, 2012-13 to 2017-18

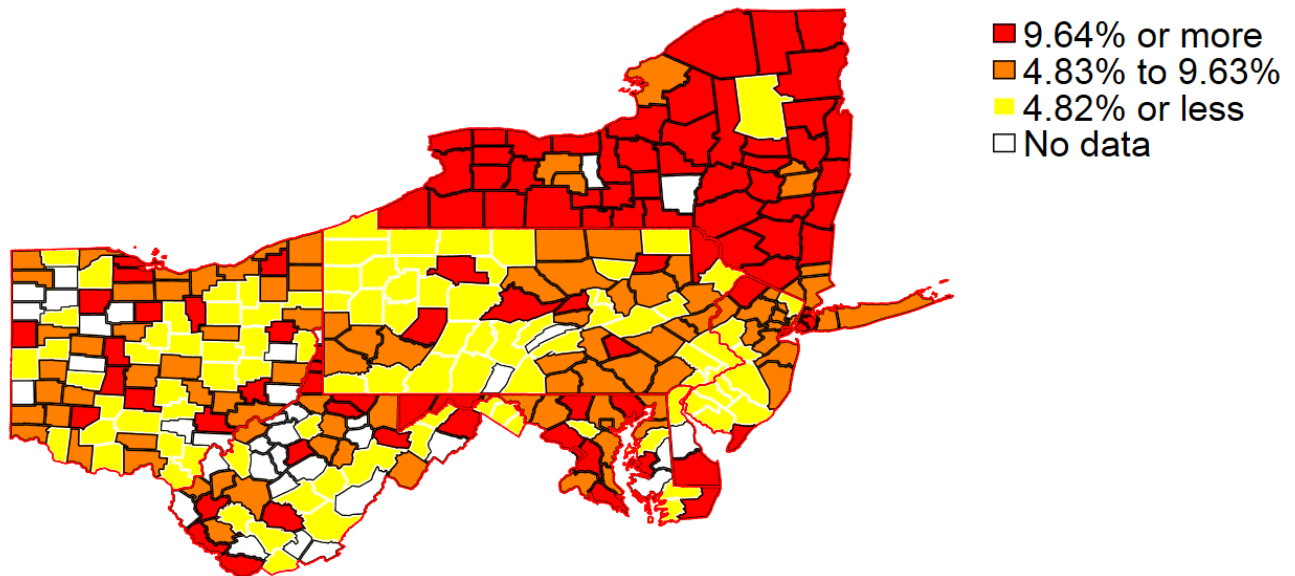
State	Percent Change in Minimum Wage (adjusted for inflation) 2012-13 to 2017-18	Percent Change in Average Weekly Wages 2012-13 to 2017-18		Percent Change in Employment 2012-13 to 2017-18	
		All industries	Food Services and Drinking Places	All industries	Food Services and Drinking Places
Delaware	5.9%	0.8%	5.1%	8.7%	13.4%
District of Columbia	41.0%	4.5%	9.5%	6.8%	22.7%
Maryland	18.7%	4.2%	11.2%	5.6%	10.7%
New Jersey	9.4%	2.3%	6.4%	6.3%	12.5%
New York	29.0%	6.4%	15.0%	8.6%	17.2%
Ohio	-1.5%	4.0%	7.1%	6.1%	9.9%
West Virginia	12.3%	3.7%	8.8%	-3.1%	1.5%
Regional Average (excluding PA) ¹	15.9%	4.8%	11.1%	6.9%	13.3%
Pennsylvania	-6.9%	4.6%	6.6%	4.5%	8.2%

¹ The percent change in real minimum wages and average weekly wages for the region is an employment weighted average across DE, DC, MD, NJ, NY, OH, and WV.

Source: Keystone Research Center analysis of Bureau of Labor Statistics Quarterly Census of Employment and Wages (<https://www.bls.gov/cew/>)

Map 1. Wage Growth in Food Services and Drinking Places in Pennsylvania Trails Most Counties in Neighboring States

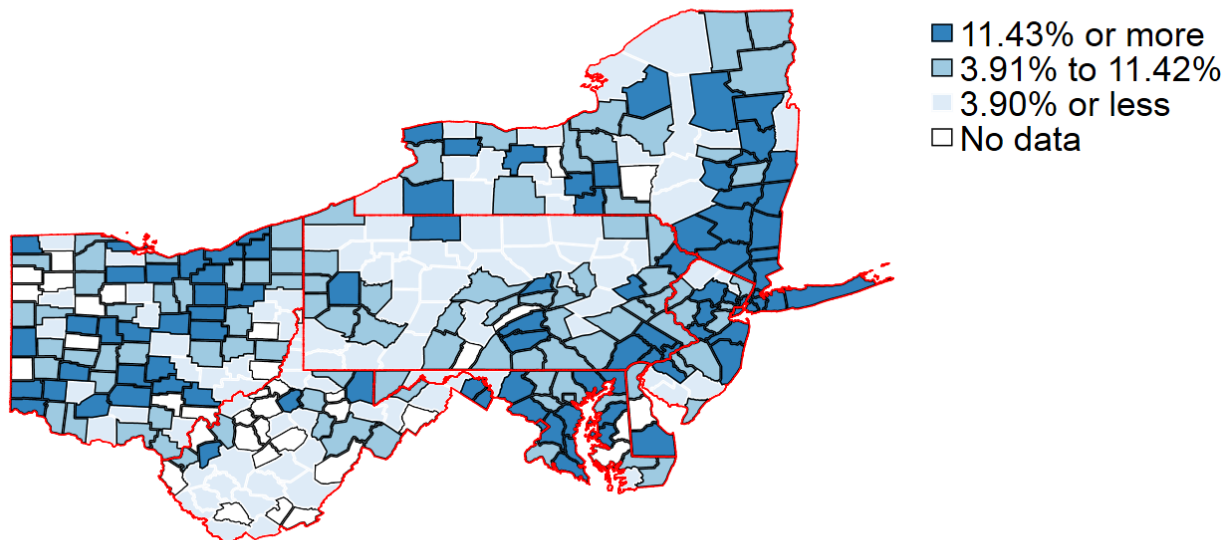
Percent Change in Real Annual Average Weekly Wage: Food Services and Drinking Places, 2012 to 2017



Source: Keystone Research Center analysis of Bureau of Labor Statistics Quarterly Census of Employment and Wages (<https://www.bls.gov/cew/>)

Map 2. Employment Growth in Food Services Also Trails Most Counties in Neighboring States

Percent Change in Annual Average Employment: Food Services and Drinking Places, 2012 to 2017



Source: Keystone Research Center analysis of Bureau of Labor Statistics Quarterly Census of Employment and Wages (<https://www.bls.gov/cew/>)

The counties shaded in red in Map 1 (previous page) had the most growth in wages between 2012 and 2017 and yellow, the least. As the map makes clear, there was, in general, more growth in wages in food services and drinking places across the region than in Pennsylvania. Similarly, in Map 2 (previous page), employment growth in this sector at the county level has been stronger in the region (counties in dark blue grew the fastest) compared to Pennsylvania. This stronger employment growth was also present in the counties that make up New York City.

Neither the IFO's simple descriptive analysis of several months of preliminary employment data for full-service restaurants in New York City nor our analysis of employment and wage data for Food Service and Drinking Places across the region, can conclusively answer whether a minimum wage increase reduced employment in the region. This is why, when academic economists study minimum wage increases, they deploy statistical techniques to tease out the impact of a wage increase on employment from other factors.²² As we have summarized earlier in this report the most current and sophisticated research using the best controls for other variables that impact employment and more precisely isolating and estimating employment effects of minimum wage increases find that minimum wage increases do not reduce employment among low-wage workers. There is no evidence, in sum, to support the prediction that the elimination the tipped minimum will reduce employment in Pennsylvania.

²² Sylvia Allegretto, Arindrajit Dube, Michael Reich, Ben Zipperer. 2017. "Credible Research Designs for Minimum Wage Studies: A Response to Neumark, Salas and Washcher." ILR Review <http://irle.berkeley.edu/credible-research-designs-for-minimum-wage-studies-a-response-to-neumark-salas-and-wascher/>

\$15 by 2025

The IFO’s analysis of the proposal to raise the minimum wage by 50 cents a year starting in July 2020 until it reaches \$15 per hour in July 2025 is truncated reflecting the IFO’s judgement that a minimum wage of \$15 relative to the median wage in 2025 will be higher than it has been in any of the state level minimum wage increases studied between 1979 and 2017.

We present estimates from the Economic Policy Institute’s Minimum Wage Simulation Model (MWSM) of the number of workers affected (Table 6) and the total increase in wages (Table 7) of each proposed minimum wage increase from \$12 this July to \$15 in July 2025. Focusing on the final step to \$15 in 2025 we estimate that 33.7% of the state’s workforce or just over 2 million workers would see their wages rise by 2025.²³ In total a minimum wage of \$15 by 2025 will raise wages by 9.5 billion dollars (2018 dollars). Table 8 on page 16-18 presents the demographic characteristics of the workers affected by a \$12 minimum wage this July and by a \$15 minimum wage in July 2025.

Table 6.
Summary of minimum wage increases under proposed increase of Pennsylvania minimum wage, and numbers of workers affected by the increases, 2019–2025

Date	Minimum wage	Total estimated state workforce	Directly affected	Indirectly affected	Total affected	Affected workers' share of state workforce
1-Apr-19	\$7.25					
1-Jul-19	\$12.00	5,851,000	1,132,000	536,000	1,668,000	28.5%
1-Jul-20	\$12.50	5,874,000	1,031,000	679,000	1,710,000	29.1%
1-Jul-21	\$13.00	5,876,000	1,046,000	753,000	1,799,000	30.6%
1-Jul-22	\$13.50	5,899,000	1,059,000	788,000	1,846,000	31.3%
1-Jul-23	\$14.00	5,922,000	1,062,000	835,000	1,897,000	32.0%
1-Jul-24	\$14.50	5,945,000	1,044,000	896,000	1,940,000	32.6%
1-Jul-25	\$15.00	5,969,000	1,048,000	965,000	2,013,000	33.7%

Notes: Values reflect the result of the proposed change in the state minimum wage. Totals may not sum due to rounding. Shares calculated from unrounded values. Directly affected workers will see their wages rise as the new minimum wage rate exceeds their existing hourly pay. Indirectly affected workers have a wage rate just above the new minimum wage (between the new minimum wage and 115 percent of the new minimum). They will receive a raise as employer pay scales are adjusted upward to reflect the new minimum wage. Wage increase totals are cumulative of all preceding steps. Estimate assumes tipped workers will be paid the full minimum wage.

Source: Economic Policy Institute Minimum Wage Simulation Model using data from the Census Bureau, Bureau of Labor Statistics, and Congressional Budget Office. See EPI Minimum Wage Simulation Model 2019. Dollar values adjusted by projections for CPI-U in CBO 2018.

²³ The IFO estimates that as of 2018 there 1.94 million workers with earnings below \$15.

Table 7.

Wage impacts of increasing the Pennsylvania minimum wage to \$15 by 2025, 2019–2025 (2018\$) for all (directly & indirectly) affected workers

Date	Minimum wage (nominal \$)	Minimum wage (2018\$)	Total wage increase (thousands 2018\$)	Change in average hourly wage (2018\$)	Change in avg. annual income (year-round workers) (2018\$)	Real percent change in average annual income
1-Apr-19	\$7.25	\$7.08				
1-Jul-19	\$12.00	\$11.73	\$5,361,309	\$2.11	\$3,214	17.5%
1-Jul-20	\$12.50	\$11.92	\$5,841,049	\$2.25	\$3,416	17.9%
1-Jul-21	\$13.00	\$12.09	\$7,122,902	\$2.56	\$3,959	20.2%
1-Jul-22	\$13.50	\$12.25	\$7,578,755	\$2.65	\$4,104	20.2%
1-Jul-23	\$14.00	\$12.40	\$8,110,598	\$2.76	\$4,276	20.3%
1-Jul-24	\$14.50	\$12.54	\$8,640,375	\$2.87	\$4,453	20.3%
1-Jul-25	\$15.00	\$12.68	\$9,517,975	\$3.10	\$4,729	21.3%

Notes: See Table 6.

Source: Economic Policy Institute Minimum Wage Simulation Model using data from the Census Bureau, Bureau of Labor Statistics, and Congressional Budget Office. See EPI Minimum Wage Simulation Model 2019. Dollar values adjusted by projections for CPI-U in CBO 2018.

Table 8.

Demographic characteristics of workers who would benefit if the Pennsylvania minimum wage were raised to \$12 in July 2019 and eventually to \$15 in July 2025.

Category	\$12 by July 2019			\$15 by July 2025		
	Total affected	Share of group who are affected	Group's share of state total affected	Total affected	Share of group who are affected	Group's share of state total affected
Total	1,668,000	28.5%	100.0%	2,013,000	33.7%	100.0%
Sex						
Women	1,019,000	35.0%	61.1%	1,220,000	41.1%	60.6%
Men	649,000	22.0%	38.9%	792,000	26.4%	39.4%
Age						
20 +	1,497,000	26.6%	89.8%	1,800,000	31.3%	89.4%
Under 20	171,000	77.6%	10.2%	213,000	94.8%	10.6%
Age Detailed						
16 to 24	561,000	72.9%	33.6%	652,000	83.0%	32.4%
25 to 39	506,000	28.0%	30.3%	606,000	32.9%	30.1%
40 to 54	300,000	16.1%	18.0%	380,000	20.0%	18.9%
55+	301,000	21.4%	18.1%	374,000	26.0%	18.6%
Race/ethnicity						
White	1,206,000	25.6%	72.3%	1,465,000	30.5%	72.8%
Black	215,000	40.5%	12.9%	256,000	47.3%	12.7%
Hispanic	165,000	49.7%	9.9%	195,000	57.5%	9.7%
Asian	82,000	30.0%	4.9%	97,000	34.9%	4.8%
Family Status						
Married parent	202,000	14.6%	12.1%	250,000	17.8%	12.4%
Single parent	204,000	41.7%	12.2%	237,000	47.6%	11.8%
Married, no kids	288,000	17.5%	17.3%	365,000	21.7%	18.1%
Unmarried, no kids	975,000	41.7%	58.4%	1,161,000	48.7%	57.7%
Family Income						
less than \$25,000	498,000	72.7%	29.9%	565,000	80.8%	28.1%
\$25,000 - \$49,999	420,000	37.2%	25.2%	525,000	45.7%	26.1%
\$50,000 - \$74,999	280,000	25.0%	16.8%	346,000	30.2%	17.2%
\$75,000 - \$99,999	188,000	20.3%	11.3%	233,000	24.6%	11.6%
\$100,000 - \$149,999	179,000	16.1%	10.7%	219,000	19.3%	10.9%
\$150,000 or more	102,000	11.8%	6.1%	125,000	14.1%	6.2%

Table 8 (cont.)

Demographic characteristics of workers who would benefit if the Pennsylvania minimum wage were raised to \$12 in July 2019 and eventually to \$15 in July 2025.

Category	\$12 by July 2019			\$15 by July 2025		
	Total affected	Share of group who are affected	Group's share of state total affected	Total affected	Share of group who are affected	Group's share of state total affected
Industry						
Agriculture, forestry, fishing, hunting	23,000	34.2%	1.4%	27,000	39.5%	1.3%
Construction	40,000	14.6%	2.4%	54,000	18.9%	2.7%
Manufacturing	120,000	16.3%	7.2%	154,000	20.6%	7.6%
Wholesale trade	37,000	22.4%	2.2%	47,000	27.9%	2.3%
Retail trade	350,000	51.2%	21.0%	410,000	58.9%	20.4%
Transportation, warehousing, utilities	63,000	19.3%	3.8%	79,000	23.9%	3.9%
Information	13,000	13.3%	0.8%	16,000	16.2%	0.8%
Finance, insurance, real estate	38,000	10.3%	2.3%	51,000	13.7%	2.5%
Professional, scientific, management, technical services	22,000	6.5%	1.3%	31,000	8.7%	1.5%
Administrative, support, and waste management	81,000	40.2%	4.8%	95,000	46.6%	4.7%
Education	101,000	17.4%	6.1%	126,000	21.3%	6.3%
Healthcare	293,000	28.9%	17.6%	359,000	34.7%	17.8%
Arts, entertainment, recreational services	57,000	54.7%	3.4%	67,000	62.7%	3.3%
Accommodation	32,000	63.1%	1.9%	35,000	69.6%	1.8%
Restaurants and food service	275,000	77.3%	16.5%	313,000	86.5%	15.6%
Other services	107,000	45.1%	6.4%	123,000	50.9%	6.1%
Public administration	19,000	7.5%	1.1%	25,000	9.6%	1.2%

Table 8 (cont.)

Demographic characteristics of workers who would benefit if the Pennsylvania minimum wage were raised to \$12 in July 2019 and eventually to \$15 in July 2025.

Category	\$12 by July 2019			\$15 by July 2025		
	Total affected	Share of group who are affected	Group's share of state total affected	Total affected	Share of group who are affected	Group's share of state total affected
Work Hours						
Part time (< 20 hours)	243,000	59.3%	14.6%	289,000	69.2%	14.4%
Mid time (20-34 hours)	543,000	63.1%	32.5%	621,000	70.8%	30.9%
Full time (35+ hours)	883,000	19.3%	52.9%	1,102,000	23.6%	54.8%
Education						
Less than high school	251,000	62.1%	15.0%	305,000	73.9%	15.1%
High School	734,000	40.6%	44.0%	875,000	47.5%	43.5%
Some college, no degree	436,000	39.3%	26.1%	515,000	45.5%	25.6%
AA degree	122,000	22.1%	7.3%	152,000	27.1%	7.6%
Bachelor's or higher	126,000	6.3%	7.5%	166,000	8.2%	8.2%
Organizational Type						
For profit	1,420,000	31.9%	85.1%	1,703,000	37.6%	84.6%
Government	83,000	12.7%	5.0%	106,000	15.9%	5.3%
Non-profit	165,000	21.9%	9.9%	203,000	26.5%	10.1%
Poverty Status						
At or below the poverty line	254,000	80.2%	15.2%	283,000	87.7%	14.0%
101–200 percent of poverty	416,000	62.1%	24.9%	484,000	70.9%	24.0%
201–400 percent of poverty	568,000	30.6%	34.0%	712,000	37.6%	35.4%
401 percent or above	384,000	13.0%	23.0%	478,000	15.9%	23.8%
Poverty status not available	47,000	76.2%	2.8%	56,000	89.0%	2.8%
Tipped Workers						
Not tipped workers	1,498,000	26.4%	89.8%	1,839,000	31.7%	91%
Tipped workers	170,000	100.0%	10.2%	173,000	100.0%	9%

Source: Economic Policy Institute Minimum Wage Simulation Model using data from the Census Bureau, Bureau of Labor Statistics, and Congressional Budget Office. See EPI Minimum Wage Simulation Model 2019. Dollar values adjusted by projections for CPI-U in CBO 2018.

Appendix A:

In its 2015 and 2016 reports the IFO following the CBO's 2014 analysis reduced the teen response parameter by two-thirds, assuming a 10% increase in the minimum wage would reduce employment for adults by 1.5%.

Starting with its April 2017 report the IFO moved to reporting the response parameters it was using by wage level rather than by age, but the parameters remained based on the original CBO teen parameters with slightly higher parameters (greater than 1.5%) for the lowest-wage workers reflecting a greater concentration of young workers. As you move to higher-wage groups of workers the parameters fall to less than 1.5% and begin approaching zero.

Specifically, in April 2017 the IFO assumed each 10% increase in the minimum wage would reduce employment by 1.8% for the lowest-wage workers (those earning \$7.25 to \$8.99 per hour) with the responsiveness falling to -0.1% for workers with wages just below \$12.

In April 2018 the parameters were adjusted up slightly to 2% for workers earning between \$7.25 and \$8.99 and similarly upward to 1% for those earning less than 12.

The most recent March 2019 report bifurcated the response parameters by part-time and full-time status. Each 10% increase in the minimum wage was assumed to reduce employment for the lowest-wage workers by between 1.5% and 2% with the negative effect falling to 0.3% for workers earning \$11 or more. In Table A2 and Table A3 we report the results of our replication of the IFO's predictions of job loss from previous years using the March 2019 response parameters. There are small differences between the IFOs

Table A1.

IFO Reports	Percent Reduction in Employment from a 10% increase in the minimum wage
Nov 2015	
Teens	-4.5%
Adults	-1.5%
Apr 2016	
Teens	-4.5%
Adults	-1.5%
Apr 2017	
\$7.25 to \$8.99	-1.8%
\$9.00 to \$9.99	-1.4%
\$10.00 to \$10.99	-1.0%
\$11.00 to \$11.99	-0.1%
Apr 2018	
2019: Increase to \$10.00	
\$7.25 to \$8.99	-2.0%
\$9.00 to \$9.99	-1.5%
2020: Increase to \$11.00	
\$10.00	-1.5%
\$10.00 to \$10.99	-1.5%
2021: Increase to \$12.00	
\$11	-1.0%
\$11.00 to \$11.99	-1.0%
Mar 2019	
Part time	
\$7.25 to \$7.99	-2.0%
\$8.00 to \$9.99	-1.3%
\$10.00 to \$10.99	-0.8%
\$11.00 to \$11.99	-0.3%
Full time	
\$7.25 to \$7.99	-1.5%
\$8.00 to \$9.99	-1.0%
\$10.00 to \$10.99	-0.5%
\$11.00 to \$11.99	-0.3%

Source: Keystone Research Center based on the Independent Fiscal Office

original predictions and our replication using their most recent response parameters but overall the data in (Table A2) make it clear the IFO’s job loss predictions are essentially unchanged and derived from a response parameter for teens.

Table A2.

Replicating the Independent Fiscal Office's Job Loss Predictions for Previous Years Using its 2019 Response Parameters

Year ¹	New Minimum Wage	IFO		KRC	
		Estimate of the Number of Workers Directly Affected (1000s)	Predicted Job Losses (1000s)	Estimate of the Number of Workers Directly Affected (1000s)	Predicted Job Losses ² (1000s)
2015	\$10.10	1,055	31	978	23
2016	\$10.15	1,023	30	994	26
2017	\$12.00	1,342	54	1,330	43
2018	\$12.00	1,025	33	1,116	33
2019	\$12.00	1,110	34	1,023	31
	Average	1,111	36	1,088	31

¹ Year represents the year of the analysis, the CPS sample would be in each case from the prior year, for example 2015 represents estimates from the 2014 CPS,

² Differences between our replication and the IFO's original analysis are the result of differences in the number of affected workers and changes in average wages for affected workers. Those differences will be driven variation in sample construction around workers included and differences in the imputation of wages and hours.

Source: Keystone Research Center based on the Merged Outgoing Rotations of the Current Population Survey and Independent Fiscal Office.

Table A3.

Replicating the IFO's Job Loss Estimates Using It's March 2019 Response Parameters

2019											
	Employment (1000s)		Percent Change in Wages to \$12		Response Parameter		Pct. Chg. * Response Parameter		Predicted Employment Loss		
	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	
\$7.25 to \$7.99	82	20	63%	59%	-0.200	-0.150	-13%	-9%	-10	-2	
\$8.00 to \$9.99	213	130	38%	34%	-0.125	-0.100	-5%	-3%	-10	-4	
\$10.00 to \$10.99	170	177	18%	17%	-0.075	-0.050	-1%	-1%	-2	-2	
\$11.00 to \$11.99	104	128	7%	7%	-0.025	-0.025	0%	0%	0	0	
\$12.00 to \$14.99	180	617	4%	4%	0.000	0.000	0%	0%	0	0	
Directly Affected	569	454							-23	-8	
Total		1023								-31	
2018											
	Employment (1000s)		Percent Change in Wages to \$12		Response Parameter		Pct. Chg. * Response Parameter		Predicted Employment Loss		
	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	
\$7.25 to \$7.99	69	29	61%	61%	-0.200	-0.150	-12%	-9%	-8	-3	
\$8.00 to \$9.99	250	184	36%	35%	-0.125	-0.100	-5%	-3%	-11	-6	
\$10.00 to \$10.99	166	176	18%	17%	-0.075	-0.050	-1%	-1%	-2	-2	
\$11.00 to \$11.99	93	150	7%	7%	-0.025	-0.025	0%	0%	0	0	
\$12.00 to \$14.99	147	649	4%	4%	0.000	0.000	0%	0%	0	0	
Directly Affected	577	539							-22	-11	
Total		1116								-33	
2017											
	Employment (1000s)		Percent Change in Wages to \$12		Response Parameter		Pct. Chg. * Response Parameter		Predicted Employment Loss		
	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	
\$7.25 to \$7.99	107	37	62%	62%	-0.200	-0.150	-12%	-9%	-13	-3	
\$8.00 to \$9.99	309	201	37%	35%	-0.125	-0.100	-5%	-3%	-14	-7	
\$10.00 to \$10.99	198	246	18%	17%	-0.075	-0.050	-1%	-1%	-3	-2	
\$11.00 to \$11.99	60	173	7%	6%	-0.025	-0.025	0%	0%	0	0	
\$12.00 to \$14.99	170	620	4%	4%	0.000	0.000	0%	0%	0	0	
Directly Affected	673	657							-30	-13	
Total		1330								-43	

Table A3 (Cont.)

2016										
	Employment (1000s)		Percent Change in Wages to \$10.15		Response Parameter		Pct. Chg. * Response Parameter		Predicted Employment Loss	
	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time
\$7.25 to \$7.99	124	148	36%	36%	-0.200	-0.150	-7%	-5%	-9	-8
\$8.00 to \$9.99	348	35	17%	15%	-0.125	-0.100	-2%	-1%	-7	-1
\$10.00 to \$10.14	98	241	1%	1%	-0.075	-0.050	0%	0%	0	0
\$10.15 to \$10.99	54	146	4%	4%	-0.075	-0.050	0%	0%	0	0
\$11.00 to \$11.99	60	78	4%	4%	-0.025	-0.025	0%	0%	0	0
\$12.00 to \$14.99	148	171	4%	4%	0.000	0.000	0%	0%	0	0
Directly Affected	570	425							-17	-9
Total		994								-26
2015										
	Employment (1000s)		Percent Change in Wages to \$10.10		Response Parameter		Pct. Chg. * Response Parameter		Predicted Employment Loss	
	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time
\$7.25 to \$7.99	140	46	36%	34%	-0.200	-0.150	-7%	-5%	-10	-2
\$8.00 to \$9.99	300	264	18%	14%	-0.125	-0.100	-2%	-1%	-7	-4
\$10.00 to \$10.09	104	124	1%	1%	-0.075	-0.050	0%	0%	0	0
\$10.10 to \$10.99	32	90	4%	4%	-0.075	-0.050	0%	0%	0	0
\$11.00 to \$11.99	50	183	4%	4%	-0.025	-0.025	0%	0%	0	0
\$12.00 to \$14.99	154	614	4%	4%	0.000	0.000	0%	0%	0	0
Directly Affected	544	434							-17	-6
Total		978								-23

Source: Keystone Research Center based on the Merged Outgoing Rotations of the Current Population Survey and Independent Fiscal Office.