BACKGROUNDER

$15 Minimum Wages Will Substantially Raise Prices

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Abstract

Advocates for a minimum wage hike often argue that their proposals will redistribute wealth from business owners to low-wage workers. However, most minimum-wage employees work for small firms with low profits. These small businesses can only afford higher wages by raising prices. Customers—not business owners—pay that cost. Accounting for higher prices shows that minimum wage increases transfer few resources to low-income families. Some advocates dispute this and point to studies claiming that a mandatory $15-an-hour starting wage would only slightly increase fast-food prices. These studies contained numerous errors, including the assumption that a large portion of the higher wage costs simply disappears. Correcting these errors shows that a mandatory $15 starting wage would increase fast-food prices by at least one-fourth. Counting both costs and benefits shows that minimum-wage increases provide little net benefit to the poor; in fact, more low-income families lose than gain.

Raising the minimum wage creates winners and losers. Those workers who receive higher pay benefit. But the money for that higher pay comes from somewhere. Advocates for a minimum wage hike usually argue that "somewhere" means profits. They present starting-wage increases as a way to redistribute wealth from business owners to low-wage workers.

Reality is not so simple. Economic research consistently finds that businesses pass minimum-wage costs on to their customers through price increases. Most minimum-wage employees work for small firms in competitive markets. These companies have small profit margins. They can only pay higher wages if they raise prices. Customers—not business owners—pay that cost.

KEY POINTS

- Most minimum-wage employers are small businesses. Their profit margins are too small to absorb large wage increases.

- Economists find that businesses pass minimum-wage costs on to their customers by raising prices. Consumers, not business owners, bear the burden.

- The poor and middle class spend more on goods produced by minimum-wage workers than the wealthy do. Consequently, minimum wages raise prices more on the poor and the middle class than the wealthy.

- Accounting for price increases shows that minimum-wage increases transfer little net wealth to low-income families. More low-income families lose through higher prices than gain from higher wages.

- Recent studies claiming that minimum-wage increases have little effect on fast-food prices made highly unrealistic assumptions. More realistic assumptions show that a $15 mandate would raise fast-food prices by one-fourth and eliminate 900,000 fast-food jobs.

Consequently, minimum-wage increases do little to redistribute wealth. Some low-income families benefit from higher wages, but many more low-income families are hurt by higher prices. Overall minimum-wage effects are more regressive than sales-tax increases.

Some advocates have produced studies claiming that mandatory $15-an-hour starting wages would only slightly increase prices in the fast-food sector. These studies contained numerous analytical errors, including the assumption that a large portion of the wage costs simply disappear. Correcting these errors shows that mandatory $15 starting wages would increase fast-food prices by at least one-fourth.

Minimum-Wage Costs Borne by Customers

Many Americans believe that minimum-wage increases transfer income from business owners to their workers. This impression is incorrect. Most firms employing minimum-wage workers are relatively small businesses, such as fast-food restaurants or "Mom and Pop" retail stores.[1] These firms typically operate in highly competitive markets. As a result, they have fairly low profit margins. The typical fast-food restaurant, for example, earns between 3 cents and 6 cents of profit on each dollar of sales.[2] Most minimum-wage employers could not take the entire cost of higher wages out of their profits, even if they wanted to. And if their profit margins fell significantly, many of these small business owners would seek different lines of work. When starting wages rise, these businesses pass the cost on to their customers and employees.

Most discussion of minimum-wage increases focuses on the employees: Some receive higher pay—at the cost of others being forced to work fewer hours, or being let go.[3] Relatively little attention is paid to how minimum-wage increases affect prices. But customers provide the revenues that cover business expenses. When costs rise, businesses generally compensate by raising prices. Minimum-wage increases are no exception.

Of course, most firms cannot raise prices by themselves without losing business to competitors. A unilateral increase in McDonald's burger prices would send diners to Burger King or Wendy's. But when cost increases hit every firm in an industry, these firms can collectively raise prices. Though higher prices will drive some customers away, no single firm faces a competitive disadvantage.

As a result, most affected businesses respond to mandatory starting-wage increases by raising prices. As the federal Minimum Wage Study Commission found, "The most common types of [employer] responses to the increase in the minimum wage were price increases and wage ripples. No single type of disemployment response was reported with nearly the frequency of these."[4] Customers, not business owners, pay for minimum-wage increases.

Research: Prices Rise

Economists have not studied the minimum wage's price effects as extensively as its employment effects. But the research they have conducted points to higher prices.

Sarah Lemos of the University of Leicester surveyed roughly 30 studies conducted before 2005

1. Over three-fifths of workers who receive the federal minimum wage work in two economic sectors: "retail trade" or "leisure and hospitality" (which includes restaurants). See U.S. Bureau of Labor Statistics, "Characteristics of Minimum Wage Workers, 2015," Table 5, April 2016, http://www.bls.gov/opub/reports/minimum-wage/2015/pdf/home.pdf (accessed September 9, 2016). Note: A substantially larger share of workers earning "below the minimum wage" work in the leisure and hospitality sector than workers who are paid exactly the minimum wage. This is because federal law allows restaurants to pay hourly rates below the minimum wage, provided their employees earn more than the minimum wage after tips. However, the survey used to construct these tables does not include tips in its definition of hourly wages. Consequently, many restaurant employees appear to make less than the minimum wage, even though their actual income may be substantially higher after taking tips into account.

2. IBISWorld, "Industry Report 72221a: Fast Food Restaurants in the US," May 2013, and National Restaurant Association, *Restaurant Operations Report: 2013–2014 Edition*, p. 102.

3. See, for example, Jeffrey Clemens and Michael Wither, "The Minimum Wage and the Great Recession: Evidence of Effects on the Employment and Income Trajectories of Low-Skilled Workers," University of California at San Diego, November 24, 2014, http://econweb.ucsd.edu/~mwither/pdfs/Effects%20of%20Min%20Wage%20on%20Wages%20Employment%20and%20Earnings.pdf (accessed September 9, 2016).

4. Muriel Converse et al., "The Minimum Wage: An Employer Survey," in *Report of the Minimum Wage Commission* (Washington DC: U.S. Government Printing Office, 1981), pp. 241–341.

examining minimum-wage price effects.[5] These studies found that minimum-wage increases have relatively small effects on the overall price level. They reported that a 10 percent minimum-wage increase raises overall prices by about 0.2 percent to 0.3 percent. Most businesses pay more than the current minimum wage, so minimum-wage increases do not affect their costs or prices very much. But Lemos found that studies of industries with higher concentrations of minimum-wage workers generally showed larger price effects.

One noteworthy study that Lemos surveyed examined the federal minimum wage in the 1970s.[6] The federal minimum wage affects Southern businesses more than Northern firms.[7] Southern states have lower living costs and lower wages than the rest of the U.S.; these differences were even greater in the 1970s than today. The study found the South's higher effective minimum wage increased service prices. Each 10 percent difference in the effective minimum wage raised Southern service prices by 2.7 percent. It had no effect on the prices of manufactured goods.

This finding fits with economic theory. Southern manufacturers compete nationally and internationally. Higher effective Southern minimum wages do not affect their competitors in other states or countries. Affected manufacturers cannot raise prices without losing customers. However, services are local. Restaurants and hotels paying higher wages compete with local companies whose costs have also risen. Such companies can, and do, respond by raising prices.

More recent research comes to the same conclusion as the studies Lemos surveyed. Daniel Aaronson, Eric French, and James MacDonald, researchers at the Federal Reserve Bank of Chicago and the Department of Agriculture, published a study in 2008 examining how restaurants respond to minimum-wage increases.[8] They used Consumer Price Index (CPI) data and examined the 1996–1997 federal minimum-wage increase. They found that a 10 percent increase in the minimum wage raises overall restaurant prices approximately 0.7 percent. Unsurprisingly, they found larger effects in restaurants that employ more minimum-wage workers. Prices increased twice as much—by approximately 1.5 percent—at fast-food restaurants. In lower-wage regions, fast-food prices rose 1.8 percent. Aaronson, French, and MacDonald concluded that their results are consistent with restaurants passing the full cost of minimum-wage increases on to customers, although their results were too imprecise to ascertain whether this actually occurred.

In 2010, Denis Fougère, Erwan Gautier, and Hervé Le Bihan, researchers at the Bank of France, criticized the econometric model that Aaronson and his co-authors used.[9] They concluded that that model inaccurately estimates minimum-wage price effects.[10] They used data from the French version of the CPI and examined how France's annual minimum-wage increases affect restaurant prices. They concluded that a 10 percent minimum-wage increase raises restaurant prices by approximately 1 percent, although it takes one to three years for price increases to fully materialize.[11]

Their estimate was higher than that found by Aaronson and his coauthors. That difference may result from Fougère and his colleagues using a better

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5. Sara Lemos, "A Survey of the Effects of the Minimum Wage on Prices," *Journal of Economic Surveys*, Vol. 22, No. 1 (2008), pp. 187–212.

6. Walter Wessels, *Minimum Wages, Fringe Benefits and Working Conditions* (Washington, DC: American Enterprise Institute, 1980).

7. In 1979, the federal minimum wage covered about one-tenth of workers in Massachusetts, New Jersey, and New York. It covered approximately one-fifth of workers in Alabama, Arkansas, and Mississippi. Author's analysis using data from the 1979 Current Population Survey Outgoing Rotation Groups.

8. Daniel Aaronson, Eric French, and James MacDonald, "The Minimum Wage, Restaurant Prices, and Labor Market Structure," *The Journal of Human Resources*, Vol. 43, No. 3 (Summer 2008), pp. 688–720.

9. Denis Fougère, Erwan Gautier, and Hervé Le Bihan, "Restaurant Prices and the Minimum Wage," *Journal of Money, Credit, and Banking*, Vol. 42, No. 7 (October 2010), pp. 1199–1234.

10. They conduct Monte Carlo simulations and show that a linear model with distributed lags and an aggregate price index will asymptotically converge to the true value of price pass-through. However, the speed of this convergence is slow and in "small" samples (that is, the sizes currently available to researchers) this model will systematically overstate the speed of price adjustment. Moreover, a linear distributed lag model with aggregate price data produces very high standard deviations across simulations in small samples (on the order of twice the true-effect size in the data-generating process); results using this model are estimated very imprecisely.

11. More precisely, they found an increase of approximately 1 percent for traditional sit-down restaurants and 1.2 percent for fast-food restaurants. See Fougère, Gautier, and Le Bihan, "Restaurant Prices and the Minimum Wage," p. 1227.

methodology; it could also occur because France has a higher minimum wage than the United States. Consequently, French minimum-wage increases have a greater effect on restaurant costs. Fougère and his coauthors found somewhat less than full-cost pass-through, but they could not rule out the possibility that French restaurants passed on the entire cost of minimum-wage increases to their customers.[12]

One exception to the general finding that restaurants pass almost all minimum-wage cost increases directly to customers comes from Daniel MacDonald and Eric Nilsson, two researchers from California State University at San Bernardino.[13] They found that consumers bear only half the cost of minimum-wage increases through higher prices. However, these researchers used a similar approach to Aaronson and his coauthors. Fougère and his colleagues also found less than full-cost pass-through in their French data when they used that econometric model.[14] Most other studies have found that businesses pass either the vast majority, or all, of the costs of starting-wage increases to their customers.

Even left-leaning researchers come to this conclusion. Sylvia Allegretto and Michael Reich are economists at the University of California at Berkeley. Both publicly advocate raising the minimum wage. These researchers examined how San Jose's 2013 starting-wage increase (to $10 an hour) affected restaurant prices.[15] Using online menu data, they concluded that San Jose restaurants passed essentially the full-wage increase on to their customers.

Emek Basker and Muhammad Khan, researchers at the Census Bureau and the Islamic Development Bank, respectively, came to a similar conclusion in 2016.[16] These researchers used data from a community survey used to estimate cost-of-living differences between cities.[17] This survey records the price of a McDonald's quarter-pounder, a regular Pizza Hut cheese pizza, and Kentucky Fried Chicken fried drumsticks across America. They found that a 10 percent increase in required starting wages raises the price of burgers and pizza by about 1 percent. Curiously they found little effect on KFC chicken prices.[18] They report that their findings are consistent with full pass-through of costs to consumers—if payrolls account for half of fast-food restaurants' costs.

Interestingly, most data show that fast-food restaurants spend only a quarter of their budget on wages and benefits.[19] Basker and Khan's findings thus suggest that restaurants may raise prices more than what is necessary to cover costs.

Higher Prices Reduce Sales

Customers typically buy less at higher prices. This particularly applies to restaurants. Eating out is a luxury for most Americans; as it becomes more expensive, they cut back. Fast-food customers are especially price sensitive.

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12. Their confidence interval on their estimates included values consistent with full cost pass-through.

13. Daniel MacDonald and Eric Nilsson, "The Effects of Increasing the Minimum Wage on Prices: Analyzing the Incidence of Policy Design and Context," Upjohn Institute *Working Paper* 16-260, 2016.

14. Fougère, Gautier, and Le Bihan, "Restaurant Prices and the Minimum Wage," Table 2. Full pass-through in their data corresponded to a long-run elasticity of 0.15. They estimated elasticities ranging between 0.012 and 0.148 when they used aggregated price data and a linear distributed lags model, with the exact coefficient highly sensitive to choice of control variables. A related concern is that Fougère, Gautier, and Le Bihan found that prices take one to three years to fully adjust to price increases. MacDonald and Nilsson only looked at a four-month window surrounding minimum-wage hikes, so they may have missed part of the total effect.

15. Sylvia Allegretto and Michael Reich, "Are Local Minimum Wages Absorbed by Price Increases?" Institute for Research on Labor and Employment *Working Paper* No. 125-15, December 2015.

16. Emek Basker and Muhammad Taimur Khan, "Does the Minimum Wage Bite into Fast-Food Prices?" *Journal of Labor Research*, Vol. 37 (2016), pp. 129–148.

17. Council for Community and Economic Research, "Cost of Living Index," https://www.coli.org/ (accessed September 8, 2016).

18. Allegretto and Reich examined menu price responses for hamburger, pizza, and chicken dishes separately. They found somewhat smaller price increases for these goods than for the entire universe of menu items they examined.

19. Basker and Khan (2016) present data showing labor expenses are almost half of sales revenue in the fast-food sector. This is at odds with almost all other data sources on this topic. For example, the Census Bureau's 2012 Economic Census reported that "limited-service restaurants" (aka fast food) had payrolls of $45.4 billion on sales of $185.4 billion in 2012. Payrolls thus represent 24.5 percent of their total revenues. See also IBISWorld, "Industry Report 72221a: Fast Food Restaurants in the US," May 2013, which reports payrolls account for 26 percent of fast-food restaurants' total revenues.

TABLE 1

Customer Responsiveness to Restaurant Prices

Study	Change in Sales Following 10% Price Increase
All Food Away from Home	
• Andreyeva et al. (2010), survey of 13 studies	−8.1%
Fast Food	
• Richards and Mancino (2014)	−7.4%
• Jekanowski et al. (2001)–1992	−18.8%
• Jekanowski et al. (2001)–1982	−10.2%
• Brown (1990)	−10.0%
• Okrent and Kumcu (2014)	−9.0%
• Okrent and Alston (2012)	−1.3%
Average Fast Food Response	−9.5%
Median Fast Food Response	−9.5%

SOURCES: Compiled by author. See Appendix 2.

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Table 1 shows how Americans react to higher restaurant prices. The table shows estimates of how much sale volumes fall when prices rise 10 percent. The first row shows the conclusion of a meta-analysis conducted by economists in the U.S. Department of Agriculture (USDA) Economic Research Division in 2010.[20] Across 13 studies of food away from home (both fast-food restaurants and traditional restaurants) the USDA economists estimate that a 10 percent price increase causes sales to fall by 8.1 percent.[21]

Restaurants lose business when prices rise, even when competitors raise prices, too.

The following rows show every study conducted on fast-food price responsiveness since 1990.[22] These studies (unsurprisingly) show fast-food customers to be even more price sensitive than restaurant customers overall. On average, they find that a 10 percent increase in restaurant prices causes fast-food sales to drop 9.5 percent.

This price sensitivity means that restaurants must raise prices by more than the amount by which minimum-wage increases raise costs. When they raise prices, they lose business. But restaurants must still cover fixed costs like rent, marketing, and utilities. That requires additional price increases.

Regressive Price Increases

Customers pay for higher starting wages through higher prices. This complicates many minimum-wage advocates' Robin Hood narrative. They often argue that raising starting wages redistributes income from wealthy business owners to poorer workers. But higher minimum wages actually transfer wealth from customers to workers. Many of those customers have low incomes, while many low-wage workers come from affluent families. The poor do not obviously benefit.

Thomas MaCurdy, a Stanford University economist, studied this dynamic.[23] He examined the 1996–1997 federal minimum-wage increase using two federal surveys.[24] Table 2 draws on his findings. It shows the percentage of families with workers directly affected by the minimum-wage increase, broken down by family-income quintile.

MaCurdy found that minimum-wage workers live in families across the income distribution. While they personally have low wages, many live with family members who earn considerably more. Just over 20 percent of the poorest fifth of American families include a minimum-wage worker. A similar proportion of families in the richest fifth do,

20. Tatiana Andreyeva, Michael W. Long, and Kelly D. Brownell, "The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food," *American Journal of Public Health*, Vol. 100, No. 2 (February 2010), Table 1.

21. Food away from home showed the greatest price response of any of the food categories that Andreyeva et al. (2010) surveyed. Note: They examined the uncompensated elasticity of demand, not the income-compensated elasticity of demand.

22. This includes the fast-food studies included in the Andreyeva et al. (2010) estimates of food away from home, and more recent studies that this author identified in the economic literature.

23. Thomas MaCurdy, "How Effective Is the Minimum Wage at Supporting the Poor?" *Journal of Political Economy*, Vol. 123, No. 2 (2015), pp. 497–545.

24. The Survey of Income and Program Participation (SIPP) and the Consumer Expenditure Survey (CE).

TABLE 2

Families with Minimum Wage Workers and Burden of Price Increases, by Quintile

	SHARE OF FAMILIES WITH A MINIMUM WAGE WORKER	MINIMUM WAGE-DRIVEN PRICE INCREASES AS A PERCENT OF ANNUAL FAMILY SPENDING	
Quintile	by Income Quintile	by Income Quintile	by Consumption Quintile
1st (lowest)	22.4%	0.59%	0.63%
2nd	19.9%	0.50%	0.56%
3rd (middle)	22.5%	0.51%	0.56%
4th	24.1%	0.54%	0.57%
5th (top)	22.5%	0.58%	0.52%

SOURCE: Thomas MaCurdy, "How Effective Is the Minimum Wage at Supporting the Poor?" *Journal of Political Economy*, Vol. 123, No. 2 (2015), pp. 497 and 545, Tables 4 and 5.

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too. About one in five workers in the second, middle, and fourth income quintiles also include minimum-wage employees. Some poor workers benefit from minimum-wage increases (if they keep their jobs). But a sizeable portion of the benefits go to middle-class and upper-middle-class families.

Price increases caused by minimum-wage increases may disproportionately hit lower-income families. For example, low-income and middle-income families eat more fast food than high-income families. To the extent a minimum wage increase raises fast-food prices, it will hurt the poor and middle class more than the wealthy. MaCurdy also investigated this, finding the minimum-wage increase disproportionately raised prices on the poor.[25]

On average the 1996–1997 federal minimum-wage increase raised prices 0.59 percent on families in the bottom income quintile—slightly more than any other income quintile. Many economists believe that consumption measures living standards better than income. (Some families with low incomes nonetheless enjoy relative affluence, such as retirees drawing on substantial savings.) So MaCurdy also examined families by consumption quintiles. This showed the costs falling even more heavily on the poor. The minimum-wage increase raised prices for the poorest consumption quintile by 0.63 percent. Prices rose just 0.52 percent in the top consumption quintile.

Minimum-wage-driven price increases raise prices disproportionately on goods and services purchased by the poor. Viewed as a consumption tax, the minimum wage charges the poor higher rates than the middle class or the rich. This makes minimum-wage increases' price effects more regressive than sales taxes.

Table 3 shows MaCurdy's analysis of the net redistributive effects of minimum-wage increases. He optimistically assumed that minimum-wage increases eliminate no jobs.[26] He then analyzed who gained and lost from wage and price changes.

MaCurdy found that even under this best-case scenario, the minimum wage only marginally transfers income to the poor. On average, the 1996–1997 minimum-wage increase raised annual

25. MaCurdy assumed that employers passed the entire cost of the minimum-wage increase to their customers through price increases with no employment response. He then used data from an input-output model of the economy and the Consumer Expenditure Survey to track how much prices rose for each income and consumption quintile.

26. MaCurdy recognizes that layoffs may well occur; he assumed they do not as an analytical exercise to determine how increases would affect the poor under the ideal scenario in which they face no job losses.

TABLE 3

Winners and Losers from Minimum Wage Increases, by Income Quintile

AVERAGE NET BENEFIT, IN 2010 DOLLARS

Quintile	Families with Minimum Wage Worker	Families without Minimum Wage Worker	All Families
1st (lowest)	$521	–$74	$60
2nd	$427	–$86	$16
3rd (middle)	$412	–$114	$5
4th	$318	–$154	–$40
5th (top)	$172	–$250	–$154
All families	$370	–$136	–$23

SOURCE: Thomas MaCurdy, "How Effective Is the Minimum Wage at Supporting the Poor?" *Journal of Political Economy*, Vol. 123, No. 2 (2015), pp. 497 and 545, Tables 4 and 5.

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incomes in the bottom and second quintiles by $60 and $16 (in 2010 dollars), respectively. It did this by lowering incomes by $40 and $154 in the fourth and top quintiles, respectively. The average family lost $23.[27] The net redistribution occurred because upper quintiles spend more money in total than the lower quintiles. Consequently, they pay more of the price burden than lower-income families, even though the higher prices represent a smaller portion of their overall income.

MaCurdy also found that mandatory starting-wage increases hurt most low-income families: 78 percent of families in the bottom quintile had no minimum-wage workers. They did not benefit from the increase; however, they did face higher prices. On average, these higher prices cost them $74 a year. The average benefit occurred because the smaller number of winners in the bottom quintile gained more than the losers lost.

These figures represent an idealized scenario under which no employees lose their jobs. The net benefit for low-income families turns negative if significant job losses occur. Unfortunately, workers from low-income families are disproportionately likely to lose their jobs when the minimum wage rises. Economists have found that employers shift their hiring toward teenagers from affluent backgrounds (and away from unskilled adults) after the minimum wage increases.[28]

MaCurdy concluded that minimum-wage increases are an ineffective anti-poverty tool. Even under the best-case scenario they transfer few net resources to low-income families. They also hurt more poor families than they help.

Unrealistic Price Forecasts

Even minimum-wage-hike advocates recognize their proposals will increase prices.[29] Unfortunately,

27. The average net loss occurs because the government taxes away part of the higher wages that minimum-wage workers earn, but does not compensate families for the higher prices they pay. These taxes thus siphon off part of the gains to those who benefit from minimum-wage increases without reducing the costs to those who lose through higher prices.

28. Laura Giuliano, "Minimum Wage Effects on Employment, Substitution, and the Teenage Labor Supply: Evidence from Personnel Data," *The Journal of Labor Economics*, Vol. 31, No. 1 (January 2013), pp. 155–194.

29. See, for example, John Schmitt, "Why Does the Minimum Wage Have No Discernible Effect on Employment?" Center for Economic Policy Research, February 2013, http://cepr.net/documents/publications/min-wage-2013-02.pdf (accessed September 8, 2016).

many have unrealistic expectations about how much prices would rise. Two widely reported studies estimated that $15 starting wages would only modestly affect fast-food prices. These studies make price consequences seem trivial. They are also deeply flawed.

Researchers at Purdue University's School of Hospitality and Tourism Management released the first study.[30] They estimated the typical fast-food restaurant's sales and expenses. They then calculated how much costs would increase under $15-an-hour starting wages. Their conclusion: just 4.3 percent.

This finding received significant media attention. *The Washington Post* gave it a full write-up.[31] CBS News covered it.[32] Many papers reported on it nationwide.[33] This reporting highlighted the conclusion that $15 minimum wages would barely raise fast-food prices—just 22 cents more for a Big Mac. Virtually no reporters examined how the researchers reached this conclusion. Had they looked deeper, they would have found two enormous flaws.

First, the Purdue researchers estimated fast-food balance sheets by adding median expenses for food, utilities, and labor.[34] However, the sum of the median of each expense category will not, in general, sum to total expenses. Averages work that way; medians do not. The data they used warned of this with bold-faced capitalized warnings.[35] The Purdue researchers added the medians anyway.

As a result, their derived expenses and profits come to just 92 percent of total sales. Fully 8 per-cent of total outlays disappeared.[36] This hole in restaurant balance sheets absorbed much of the cost of $15 starting wages. It was a mathematical error that made $15 starting wages seem affordable.

Second, the Purdue researchers assumed that higher prices would not affect fast-food sales. Fast-food sales actually fall sharply when prices rise (as Table 1 shows). This means that fast-food restaurants cannot, for example, cover a 10 percent increase in costs by raising prices 10 percent. Their sales will drop at the higher prices. Consumer price sensitivity means that restaurants must raise prices by more than the amount by which their labor costs increase. The Purdue study ignored this dynamic entirely.

PERI Study's Problems

These flaws render the Purdue study essentially meaningless. Although that study received widespread media coverage, economists have paid little attention to it. Instead, serious supporters of $15 starting wages point to the research of economists at the Political Economic Research Institute (PERI) at the University of Massachusetts at Amherst. In a 2015 working paper, Robert Pollin and Jeannette Wicks-Lim analyzed the consequences of a $15 mandate on the fast-food sector.[37]

The PERI economists used a more sophisticated method than the Purdue researchers to estimate by how much $15 starting wages would cause fast-food prices to rise over four years. They accounted for

30. News release, "Study: Raising Wages to $15 an Hour for Limited-Service Restaurant Employees Would Raise Prices 4.3 Percent," Purdue University, July 27, 2015, https://www.purdue.edu/newsroom/releases/2015/Q3/study-raising-wages-to-15-an-hour-for-limited-service-restaurant-employees-would-raise-prices-4.3-percent.html (accessed September 8, 2016).

31. Roberto Ferdman, "What Paying Fast Food Workers a Living Wage Would Do to the Price of a Big Mac," *The Washington Post*, July 30, 2015, https://www.washingtonpost.com/news/wonk/wp/2015/07/30/what-doubling-the-minimum-wage-would-do-to-the-price-of-a-big-mac/ (accessed September 8, 2016).

32. Erik Sherman, "With $15 Hourly Wages, What Happens to Fast-Food Prices?" CBS Money Watch, July 29, 2015, http://www.cbsnews.com/news/with-15-hourly-wages-what-happens-to-fast-food-prices/ (accessed September 8, 2016).

33. Google News search for "fast food prices 4.3 percent Purdue," https://www.google.com/search?q=fast+food+4.3+percent+prices+purdue&ie=utf-8&oe=utf-8#q=fast+food+4.3+percent+prices+purdue&tbm=nws (accessed August 8, 2016).

34. This data came from the National Restaurant Association's *2013–2014 Restaurant Operations Report*.

35. National Restaurant Association, *2013–2014 Restaurant Operations Report*, p. 8. The warning reads "**It will become evident in the reading of this report that columns do not total when medians are involved.** The reason behind this is, **EACH LINE ITEM IS ANALYZED SEPARATELY!"** (Emphases in original.)

36. Author's calculations using data from ibid. and Richard Ghiselli and Jing Ma, "The Minimum Wage, a Competitive Wage, and the Price of a Burger: Can Competitive Wages Be Offered in Limited Service Restaurants?" Purdue University School of Hospitality and Tourism Management, July 2015.

37. Robert Pollin and Jeannette Wicks-Lim, "A $15 U.S. Minimum Wage: How the Fast-Food Industry Could Adjust Without Shedding Jobs," Political Economy Research Institute *Working Paper* No. 373, January 2015, http://www.peri.umass.edu/fileadmin/pdf/working_papers/working_papers_351-400/WP373.pdf (accessed September 9, 2016).

customer price sensitivity and used reliable sources to estimate total costs. They concluded that fast-food restaurants could cover $15 starting wages with a combination of 12 percent higher prices and revenues generated by trend sales growth. Under their scenario, fast-food employment growth would slow down, but the fast-food industry would not lose jobs.

Advocates use this study to argue that requiring $15 starting wages would have only moderately negative side-effects. Unfortunately, Pollin and Wicks-Lim also made serious errors. Three main errors drive their conclusion.

First, they assumed that nationwide fast-food sales rise without fixed costs increasing as well. They modeled fast-food sales rising at a 2.5 percent annual rate.[38] Pollin and Wicks-Lim then calculated by how much variable costs, such as for food and labor, would rise to cover those higher sales. But they assumed that fixed costs, such as rent and marketing, would not increase at all.

That assumption is wrong. Fixed costs must rise to achieve trend sales growth.[39] That trend growth comes from opening new restaurants, increased advertising, and otherwise expanding the fast-food market. These activities increase fixed costs. If fixed costs stayed constant as industry-wide sales increased, fast-food restaurants would enjoy steadily rising profit margins. They do not.

This error creates a more sophisticated hole in fast-food balance sheets: By assumption, revenues rise while fixed costs remain frozen. In their model this difference between revenues and expenses helps pay for the wage increases.[40] The PERI researchers, like the Purdue researchers, assume that much of the cost of a $15 minimum wage simply disappears.

Second, Pollin and Wicks-Lim greatly underestimate how much price increases affect fast-food sales. They calculate price sensitivity by averaging two of the estimates listed in Table 1, Okrent and Alston (2012) and Okrent and Kumcu (2014). But Okrent and Alston is an extreme outlier, estimating much lower price sensitivity than the other studies. Looking at just these two studies implies that 10 percent higher fast-food prices reduce sales by 5 percent—about half of what the other studies find. USDA economists estimated much greater price responsiveness across the entire restaurant sector.[41] It seems unlikely that fast-food customers care less about prices than customers in traditional sit-down restaurants. The PERI model requires that they do.

Third, the PERI study assumed unrealistically large savings from reduced turnover. Higher minimum wages reduce employee turnover, saving employers costs associated with filling vacant positions. Accounting for this makes sense, but Pollin and Wicks-Lim exaggerated these savings. The PERI study relied on a study of hotel-staff-turnover costs.[42] That study found that staff turnover costs hotels an average of $4,700 per position. Pollin and Wicks-Lim applied that same figure to fast-food restaurants.

They should not have done so. Replacing more-skilled employees costs more than filling less-skilled positions. The hotel-turnover study looked at several different positions. It found smaller costs when less-skilled positions turn over: $2,100 for a hotel line cook; $1,300 for room service wait staff. Moreover, cooking fast food generally requires fewer skills than hotel cooking. Assuming that fast-food restaurants pay more than double the turnover costs of hotel cooks seems implausible.

Other research also suggests that Pollin and Wicks-Lim overestimated turnover costs. A

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38. This rate is in line with the recent trend of sales-volume increases.

39. "Fixed costs" is used in this section to refer to costs that are not directly affected by rising or falling sales volume. Advertising costs are not, strictly speaking, fixed. However, falling sales due to higher prices do not mean that fast-food companies can spend less on advertising.

40. Actually, this hole in restaurant balance sheets more than pays for $15 starting wages. Their model concludes that fast-food restaurants have $2 billion in additional revenue "available for other uses" even after raising starting wages to $15. These additional funds come from the false assumption that fixed costs do not rise along with trend sales growth.

41. The USDA researchers estimated an average price sensitivity for the restaurant sector of 0.81 (so, a 10 percent increase in prices reduces sales 8.1 percent), with a lower bound on the 95 percent confidence interval for that estimate of 0.56. The Pollin and Wicks-Lim estimate of 0.5 for just the fast-food sector thus lies below the 95 percent confidence interval for the entire restaurant sector. This seems implausible. See Andreyeva, Long, and Brownell, "The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food."

42. Timothy R. Hinkin and J. Bruce Tracey, "The Cost of Turnover: Putting a Price on the Learning Curve," *Cornell Hospitality Quarterly*, Vol. 41, No. 3 (2000), pp. 14–21.

McDonald's executive published experiments that the company conducted to reduce turnover.[43] That study revealed that McDonald's internally estimates vacancies cost $788 to fill. Pollin himself published a study in 2000 that directly surveyed California businesses about turnover.[44] Restaurants reported turnover costs between $614 and $736 per position. True turnover costs are almost certainly much less than $4,700 per position in the fast-food industry.[45]

In the PERI model, fast-food restaurants recoup about one-fifth of the cost of $15 starting wages through lower turnover. More realistically, they would only recoup about 3 percent.[46] Overestimating turnover costs causes the PERI study to underestimate the cost of $15 starting wages.[47]

Significantly Higher Prices and Fewer Jobs

Had the PERI economists corrected these problems their analysis would have revealed that $15 starting wages have large negative consequences. Table 4 shows what the PERI model would show if Pollin and Wicks-Lim made three improvements to their calculations:

1. Assuming that fixed costs grow at the same rate as trend sales growth, instead of assuming that fixed costs remain unchanged when trend sales increase;

2. Using the average responsiveness of fast-food sales to price increases found by academic economists[48] instead of looking at only two studies, one of which is an extreme outlier; and

3. Modeling turnover costs of $1,000 instead of $4,700 per fast-food employee vacancy.[49]

The corrected PERI model shows that $15 starting wages significantly increase fast-food production costs. Turnover savings and balance sheet holes no longer absorb much of this increase. In response, the restaurants must raise prices. This causes sales volume to drop; food and labor costs fall proportionately as well. Nonetheless, the original price increase no longer covers fixed costs, such as rent and marketing, at the reduced sales volume. So the restaurants must increase prices yet more. Prices finally reach an equilibrium level where the slightly higher revenues from the price increases and the reduced

43. Michael Harris, "An Employee Retention Strategy Designed to Increase Tenure and Profitability in the Fast Food Industry," a dissertation presented in partial fulfillment of the requirements for the degree of Doctor of Business Administration, The University of Phoenix, December 2010, http://pqdtopen.proquest.com/doc/860122562.html?FMT=AI (accessed September 9, 2016).

44. Robert Pollin and Mark Brenner, "Economic Analysis of Santa Monica Living Wage Proposal," Political Economy Research Institute *Research Report* No. 2, August 2000, Table S-4, http://www.peri.umass.edu/fileadmin/pdf/research_brief/RR2.pdf (accessed September 9, 2016).

45. Note that $4,700 is about half the $10,080 that Pollin and Wicks-Lim estimate the 2.4 million fast-food workers who make less than $9.50 an hour earn in total annual earnings. Even the liberal Center for American Progress estimates that turnover costs represent 16 percent of base earnings when firms replace employees who earn less than $30,000 a year. The PERI estimates imply that turnover costs roughly three times that proportion in the fast-food industry. This seems highly implausible. See Heather Boushey and Sarah Jane Glynn, "There Are Significant Business Costs to Replacing Employees," Center for American Progress, November 16, 2012, p. 2, https://cdn.americanprogress.org/wp-content/uploads/2012/11/16084443/CostofTurnover0815.pdf (accessed September 9, 2016).

46. Author's calculations assuming 100 percent annual turnover rates and per-employee turnover costs of $1,000.

47. A related issue is that Pollin and Wicks-Lim overestimate turnover rates in the fast-food sector. They cite data from a 2010 report that estimated turnover in the fast-food industry of 120 percent. See J. Bruce Tracey and Timothy Hinkin, "Contextual Factors and Cost Profiles Associated with Employee Turnover," in Cathy A. Enz, ed., *The Cornell School of Hotel Administration Handbook of Applied Hospitality Strategy* (Los Angeles: Sage Publishing, 2010), pp. 736–753. However, that study simply references a 2006 online article that, in turn, referenced research conducted in 2000 by a talent management consulting firm. See news release, "Employee Turnover Depresses Earnings, Stock Prices by 38%, Nextera Research Study Shows," Nextera Enterprises, August 8, 2000, http://www.prnewswire.com/news-releases/employee-turnover-depresses-earnings-stock-prices-by-38-nextera-research-study-shows-72762742.html (accessed September 9, 2016). The height of the tech bubble occurred in 2000, and employee turnover was particularly high that year. It seems likely that turnover in the fast-food industry is currently lower. Bureau of Labor Statistics data from the Job Openings and Labor Turnover Survey data show that private-sector quit rates have fallen roughly one-fifth since 2000. The National Restaurant Association's *2013–2014 Restaurant Operations Report* reports median turnover among hourly employees in limited-service restaurants of 74 percent (see exhibit D-5). Overestimating initial turnover rates causes Pollin and Wicks-Lim to overestimate the savings from reduced turnover.

48. This average price elasticity of demand is –0.946 as shown in Table 1.

49. This calculation also assumes annual turnover rates of 100 percent instead of 120 percent, as discussed in footnote 47.

TABLE 4

Consequences of $15 Starting Wages in the Fast Food Industry

Percent Change in:	Corrected PERI Model	Heritage Foundation Estimate
Prices	24%	38%
Employment Relative to Trend	–21%	–36%
Employment levels	–13%	–

NOTE: The Corrected PERI model shows the results of the PERI model, adjusted to assume that (1) fixed costs grow at the same rate as trend sales growth instead of remaining constant, (2) the price elasticity of demand in the fast food sector is –0.946 instead of 0.5, and (3) turnover costs are $1,000 per position in the fast food industry and turnover rates are initially 100 percent a year, instead of $4,700 on 120 percent annual turnover.
SOURCE: Author's calculations using data from Robert Pollin and Jeanette Wicks-Lim, "A $15 U.S. Minimum Wage: How the Fast-Food Industry Could Adjust Without Shedding Jobs," Political Economy Research Institute, January 2015, http://www.peri.umass.edu/fileadmin/pdf/working_papers/working_papers_351-400/WP373.pdf (accessed September 8, 2016), and James Sherk, "Higher Fast Food Wages: Higher Fast Food Prices," Heritage Foundation *Issue Brief* No. 4722, September 4, 2014.

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variable costs (such as employment and food) from lower sales fully offset the higher wage rate.

These corrections reveal that $15 starting wages would significantly hurt the fast-food industry. The corrected PERI model shows that prices ultimately rise by 24 percent, while employment falls by 21 percent relative to trend, and 13 percent in absolute levels.[50] That represents 900,000 fewer fast-food jobs.[51] Under more realistic assumptions, the PERI model finds that a $15 minimum wage would hurt many fast-food workers and customers.

This author conducted similar analysis for The Heritage Foundation.[52] That analysis did not model turnover-cost reductions, and used a slightly different data source, which showed that fixed costs represent a larger share of total expenses than the PERI researchers modeled.[53] That analysis also assumed that $15 starting wages would increase labor costs more than PERI did.[54] This author's analysis concluded that $15 starting wages would ultimately increase prices by 38 percent, while reducing fast-food employment by 36 percent.

On the whole, the corrected PERI model appears more reflective of the likely effect of mandatory $15 starting wages than this author's earlier analysis.[55] Nonetheless, both models show large price and employment effects. Contrary to advocates' claims, requiring $15 starting wages would significantly raise prices and reduce employment in the fast-food sector.

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50. Author's calculations replicating the model presented in Pollin and Wicks-Lim, "A $15 U.S. Minimum Wage: How the Fast Food Industry Could Adjust Without Shedding Jobs," and making the adjustments described in the text above. See Appendix 1 for details.

51. Assuming a 2.5 percent annual trend growth in fast-food employment shows 4.2 million fast-food workers by year five of the Pollin and Wicks-Lim model. A 21 percent reduction of that employment level means 876,000 fewer fast-food jobs.

52. James Sherk, "Higher Fast-Food Wages: Higher Fast-Food Prices," Heritage Foundation *Issue Brief* No. 4722, September 4, 2014, http://www.heritage.org/research/reports/2014/09/higher-fast-food-wages-higher-fast-food-prices.

53. Both The Heritage Foundation and PERI used analysis from IBISWorld, "Industry Report 72221a: Fast Food Restaurants in the US." Heritage's report was published in September 2014 and used data from the May 2013 industry analysis. PERI's January 2015 report used data from the October 2014 industry analysis. Fixed costs dropped from an estimated 41 percent to 34 percent of total sales from the May 2013 to October 2014 reports.

54. The Heritage analysis used data from the Bureau of Labor Statistics' May 2013 Occupational Employment Statistics (OES) showing that the average fast-food cook earns $9.04 an hour, and assumed that average wages would rise to $15.50 per hour thereafter—a 71 percent increase in labor costs. PERI notes that lower-wage employees tend to work fewer hours than higher-wage employees, and thus the average employee's wage does not equal the average hourly wage that employers pay. PERI combined data from the OES and Current Population Survey to estimate the distribution of wages in the fast-food industry, as well as "ripple effects" from a $15 mandate. They estimate current average hourly wages of $10.16 in the fast-food sector, which would rise to $16.11 with $15 starting wages. This represents a 59 percent increase in average labor costs. The Heritage model also assumed a price elasticity of demand of –0.946.

55. The October 2014 IBIS estimate of fixed costs is closer than the May 2013 report to the amounts that McDonald's and Wendy's report on their 10-K forms to the Securities and Exchange Commission for company-owned restaurants. (See footnote 53.) The PERI labor-cost-increase calculations are more comprehensive and probably more accurate than this author's earlier calculations, which did not account for lower-wage employees working fewer hours. (See footnote 54.)

Higher Prices Negate Anti-Poverty Effects

Consumers pay for higher minimum wages through higher prices. Large minimum-wage increases require large price increases. The burden of these price increases falls disproportionately on low-income and middle-income Americans. These price increases are more regressive than sales taxes.

This dynamic largely negates minimum-wage increases' anti-poverty effects. Everyone in society—not just business owners—pays the costs through higher prices. Meanwhile, the benefits go to families up and down the income distribution. On balance, minimum-wage increases provide little net benefit to the poor; in fact, more low-income families lose than gain. Minimum-wage increases do not accomplish what their supporters claim they will.

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Appendix 1

The figures for the "Corrected PERI" in Table 4 come from the author's replication of the model presented in Robert Pollin and Jeanette Wicks-Lim, "A $15 U.S. Minimum Wage: How the Fast Food Industry Could Adjust Without Shedding Jobs," adjusted to use more realistic assumptions.

The model assumes total fast-food revenues of $232 billion in the first year (before any minimum-wage increase) and a total fast-food wage bill (including payroll taxes) of $56.3 billion. The model also assumes 2.5 percent trend growth in fast-food sales volume, a constant profit margin of 5 percent of revenues, and that a $15 wage mandate would increase average labor costs by 59 percent (before accounting for any reduction in turnover expenses). These figures come from Pollin and Wicks-Lim's estimates.

The model also assumes that fixed costs represent 34 percent of total revenues. That figure comes from a 2012 report from Janney Capital Markets estimating the detailed expenses of a typical McDonald's restaurant, scaled to reflect a 5 percent profit margin.[56] This figure is also consistent with the figures in the October 2014 IBIS Report that Pollin and Wicks-Lim use.[57]

In the model, the $15 mandate raises labor costs (though these cost increases are partially offset by turnover reductions). To remain profitable, the industry raises prices, which causes sales volume to fall relative to trend. The reduction in sales volume reduces variable costs (both labor and purchases) by the same proportionate amount relative to trend, but fixed costs continue to grow at the trend rate. In equilibrium, prices must rise 24 percent while sales volume drops 13 percent relative to the first year, and 21 percent relative to the projected trend growth.

The corrected model differs from the Pollin and Wicks-Lim estimates principally in that:

1. It assumes that fixed costs grow at the same rate as trend sales volume instead of remaining unchanged at the year-one level;

2. It assumes a price elasticity of fast-food demand of –0.95 instead of –0.5; and

3. It assumes that fast-food restaurants experience a 100 percent (not 120 percent) annual turnover rate and that filling a vacancy costs $1,000 (not $4,700). Under these assumptions reduced turnover offsets 2.8 percent of the higher wage bill associated with a $15 mandate, not 20 percent.

The full model calculations are available from the author upon request.

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56. Mark Kalinowski, "MCD: A 'Typical' U.S. Franchised Restaurant's Annual Income Statement," Janney Capital Markets, February 8, 2012.

57. Fixed costs represent 34 percent of total revenues in the IBIS report if "other" and utility expenses are treated as fixed costs, not variable costs. Pollin and Wicks-Lim make the opposite assumption. However, utilities are only variable costs if a restaurant remains open for fewer days or hours. If it remains open for the same number of days or hours, but serves fewer customers, it will pay approximately the same utility bill. Thus, utilities are more properly treated as a fixed cost. Comparison with the Janney report shows that most of the expenses listed as "other" by IBIS are invariant to sales volume, for instance, insurance and interest costs.

Appendix 2

Sources for Table 1

Tatiana Andreyeva, Michael W. Long, and Kelly D. Brownell, "The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food," *American Journal of Public Health*, Vol. 100, No. 2 (February 2010), Table 1.

Abigail Okrent and Aylin Kumcu, "What's Cooking? Demand for Convenience Foods in the United States," selected paper prepared for presentation at the Agricultural and Applied Economics Association's 2014 AAEA Annual Meeting, Minneapolis, MN, July 27–29, 2014.

Mark D. Jekanowski, James K. Binkley, and James S. Eales, "Convenience, Accessibility, and the Demand for Fast Food," *Journal of Agricultural and Resource Economics*, Vol. 26, No. 1 (2001).

Douglas M. Brown, "The Restaurant and Fast Food Race: Who's Winning?" *Southern Economic Journal*, Vol. 56, No. 4 (April 1990), pp. 984–995.

Timothy Richards and Lisa Mancino, "Demand for Food-Away-from-Home: A Multiple-Discrete-Continuous Extreme Value Model," *European Review of Agricultural Economics*, Vol. 41, No. 1 (2014), pp. 111–133.

Abigail Okrent and Julian Alston, "The Demand for Disaggregated Food-Away-from-Home and Food-at-Home Products in the United States," United States Department of Agriculture, Economic Research Service, *Economic Research Report* No. ERR-139, August 2012.